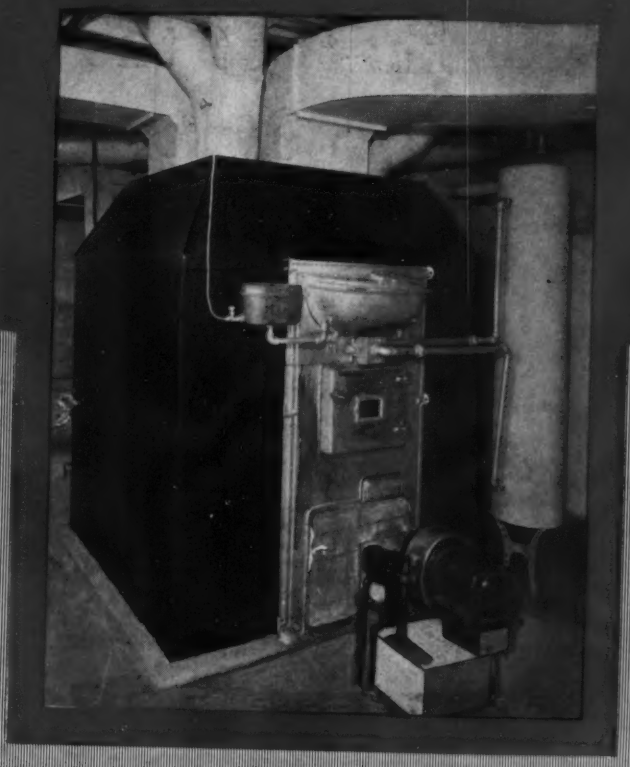
AMERICAN ARTISAN

AUGUST
1943



RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING • SHEET METAL CONTRACTING

ESTABLISHED
1880

Here, Gentlemen, is the Map that Every Sheet-Metal Shop Owner in America Should Photograph Upon His Memory!

With America gallantly at war and normalcy side-tracked for the duration, we call your respectful attention to this map of our nation.

Here at Lamneck we call it our Jobber Battlefront and we're almost as proud of it as we are of any Allied terrain where courageous men are pushing back Hitler, Tojo, and Badoglio. We call it our Jobber Battlefront—Lamneck Jobbers—they are fighting as heroically to maintain their business position as our men "over there" are battling the enemy.

For years your Lamneck Jobber has served you faithfully and well. He is your friend and, ofttimes, your counselor.

Today, like all of us, he is concentrating on one thing: winning this war. Nothing else matters. Nothing could be so important.

He knows, however, that Peace will come. And with it an avalanche of new business such as this country has never seen. So, being a smart business man, he is doing some planning.

As a distributing factor, no agent or go-between has served his customers in fuller measure. He is the man who has always stood ready to bring you the best, with the most commensurate profits. He will serve you again ... yes, better than ever ... when the great day of victory comes over the horizon!

LAMNECK PRODUCTS, INC., Middletown, Ohio

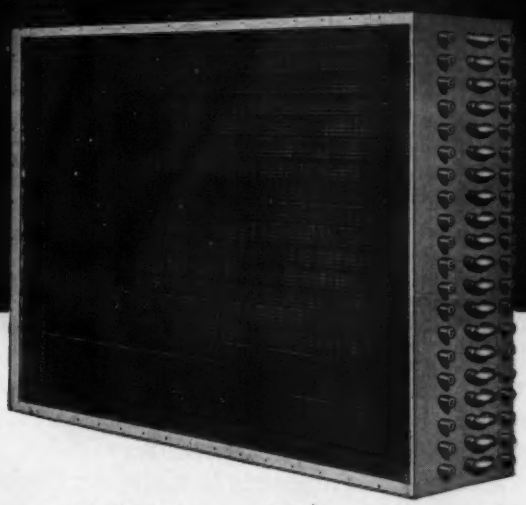
Simplified Furnace Pipe and Fittings and Prefabricated Duct and Fittings for all Types of Residential Gravity and Forced Warm Air Heating and Air Conditioning Systems.

USAIRCO Coils

STEAM, WATER, REFRIGERATION

Available

For prompt delivery on priority orders!



USAIRCO COILS are engineered and fabricated to meet the job requirements and the operating budget. They are sturdy, efficient, finely finished and tested to deliver rated capacities. Steam coils for heating, water coils for heating or cooling, and special coils for refrigeration are available. Our increased manufacturing facility assures delivery of USAIRCO Coils on time.

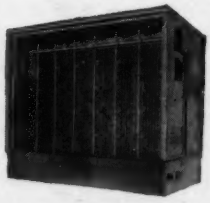
Used in conjunction with USAIRCO air handling equipment, Blast Coils and Cooling Coils help maintain proper regulation of temperature. With a background of 20 years in serving Industry, USAIRCO air conditioning units are doing a job today for every phase of the War Effort. Individual units and assemblies of Blowers—Washers—Coils—Filters are on duty in Army Camps, hospitals, ships, air bases, war plants, shipyards and industrial plants.

Write today for complete details, prices and delivery dates.

UNITED STATES AIR CONDITIONING CORPORATION

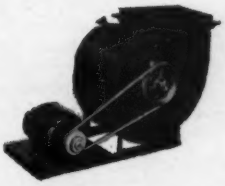
Manufacturers of the most complete line of air-handling equipment. Factory representatives in principal cities.

NORTHWESTERN TERMINAL • MINNEAPOLIS, MINNESOTA



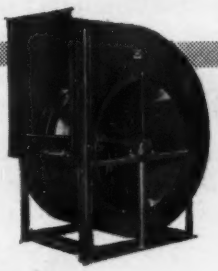
AIR WASHERS

Single and double stage air washers in various capacities for all needs. Used in installations where dependable equipment is required for air cleaning, cooling, humidifying or dehumidifying. Air Washers operate with cold water or refrigerating apparatus.



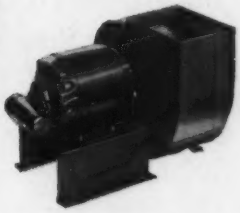
"E" BLOWERS

Belt-driven exhaust blower for light duty work where static resistance is low. Type "E" Blowers are easy to service; are available in several discharge arrangements. An adjustable pulley permits 30% speed variation to handle air as required in different installations.



HEAVY BLOWERS

Backwardly curved blade type shown (also blowers with forwardly curved blades), available in types and capacities ranging from 2,000 to 70,000 c.f.m. Used for large scale air handling jobs. Made in single and double inlet, and in varied discharge arrangements.



"SU" BLOWERS

Direct-driven exhaust blowers are designed for use where space is limited. Built strongly, mounted rigidly to prevent vibration. Slow speed motor operates the wheel. Efficient for exhaust applications in warehouses, factories, barracks or mess halls.

UNIT HEATERS

Suspension type small area heater for use with steam. Deflecto Grilles distribute heat where needed. This type of heater is ordinarily used to supplement central systems in large Defense plants, Army camp barracks and community buildings.

AMERICAN ARTISAN

WITH WHICH ARE MERGED

FURNACES & SHEET METALS

AND

Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor — A. A. Kennedy, Assistant Editor

Vol. 112, No. 8 — August, 1943 — Founded 1880

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In This Issue

ON eight pages in this issue, American Artisan presents a study of the furnace situation as it is right now.

Questionnaires to readers established the number of furnaces of all types and the number of principal repair parts required to keep the American public healthy this winter. These estimates of needs by readers were then projected to show the needs of all Artisan readers in the same states.

Thus by projection—and only among our own readers—we arrive at the total number of furnaces and parts our readers need before January 1.

❖

Along with this survey of the needs of AA readers, we also publish a summary of the total possible furnace production between now and January 1, as reported by manufacturers a few weeks ago.

Then there is also the report of housing agencies on the number of furnaces required before January 1 for new war worker housing to be constructed.

❖

By putting all these facts together, we present a picture which the editors believe is a true and fair analysis of the needs of this industry and the possibilities of satisfying these needs.

To the hundreds of contractors and manufacturers and individuals who contributed information, our thanks.

Finally, this publication proposes to send a copy of this issue with this survey to every Washington agency official who can make use of the survey in his planning. If any reader wishes to suggest an individual who should get a copy—give us his name, connections, address.

Member of Audit Bureau of Circulations — Member Associated Business Papers, Inc.

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Nonsense! Among contractors and engineers throughout the country, I'm known as a top-ranking . . .

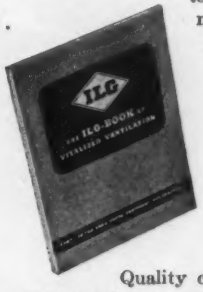
But whoa! I see what you're driving at. You mean, am I really "up" on *all* the newest developments? Have I been following precedent too long . . . relying on the old long-established methods? Are there better ways, *newer* ways, of doing some things which I haven't yet investigated?

Ventilation, for example. Is there a way to provide *more effective* ventilation—a modern, economical way—that I'm not familiar with?

Why don't I send for that free booklet of ILG's?—the one incorporating the newest developments in ventilating theory and practice!

ILG ELECTRIC VENTILATING CO.
2871 N. Crawford Avenue, Chicago, Ill.
Offices in 39 Principal Cities

YOU'LL NEED TO KNOW up-to-date methods of ventilation as your problems change with the *changing times.* This big, free 88-page book—condensed and indexed for quick reference—belongs on the desk of every contractor and engineer! It's the culmination of 37 years of experience with all kinds of ventilation—in homes, stores, plants, skyscrapers, structures of all kinds—with graphic examples of every type of ILG installation. Regularly priced at one dollar a copy—but sent *free* to contractors and engineers. Write—on your letterhead—today.



Quality costs less . . . in the long run! That's why so many leading contractors and engineers specify ILG Direct-Connected Universal Blowers, Self-Cooled Motor Propeller Fans and "Vital Zone" Unit Heaters. Get latest catalogs now!

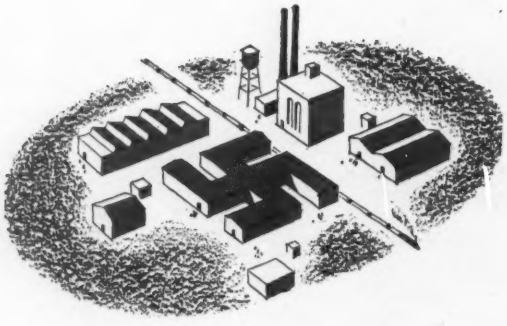
ARMY E NAVY

ILG

VITALIZED VENTILATION

AND AIR CONDITIONING

AIR CHANGE...NOT JUST AIR MOVEMENT!



On target • Without the thin steel fins which hold a dropping bomb steady on its target, our bombardiers might as well open the bomb bays and just let 'em go overboard. The deadly-accurate Norden bombsight would be useless. There's nothing amazing about those steel tail-fin sheets —nothing except the fact that they must be produced fast—and well. This is one of the war jobs on which Bethlehem sheet mills are hard at work.

BETHLEHEM STEEL

Hot Weather is Furnace Repair Weather

GET FURNACES IN SHAPE NOW AND HELP THE GOVERNMENT TO CONSERVE FUEL NEXT WINTER

NOW, when furnaces are idle is the time to get them in good working order for next winter. It means conservation of fuel in line with the Government's big program and it also means speeding production of planes, tanks, ships, and guns by keeping war workers comfortable and fit.

This offers a real opportunity to the Rybolt furnace dealer to aid the war effort and develop profitable business for himself. Check every RYBOLT furnace in your community and urge that it be cleaned and repaired if necessary. You will be rendering a real service to your customers as well as furthering an important war activity.

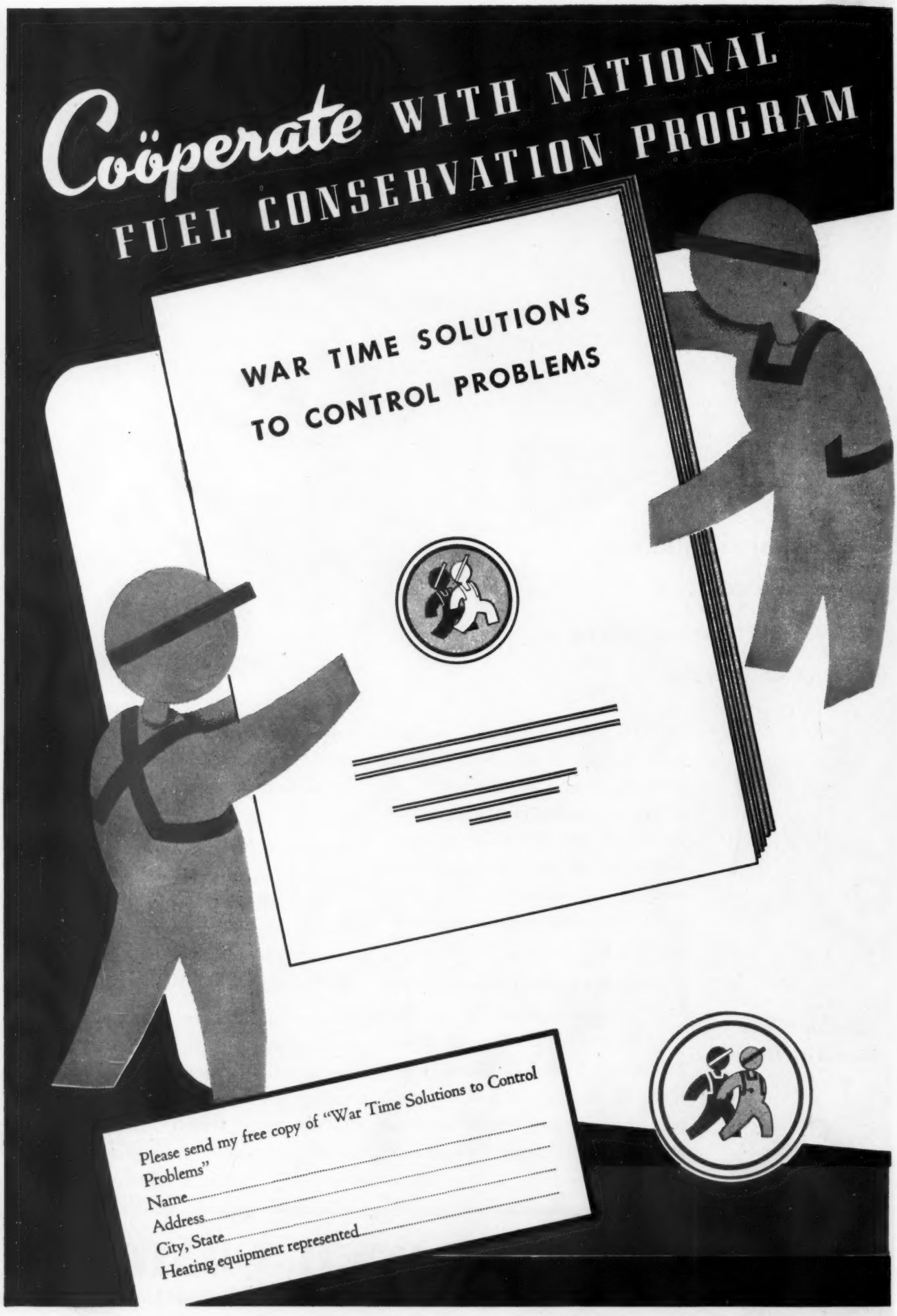
For best results, be sure to get genuine RYBOLT repair parts... made from original patterns with quality materials. They'll fit right and give dependable service because they are identical with parts used in the original RYBOLT unit.

Where furnaces are absolutely beyond repair, we are in a position to supply a limited number of RYBOLT units for replacement, under Government Order P-84. Write for information.

Save or Slave—
Buy War Bonds

THE RYBOLT HEATER COMPANY

615 MILLER STREET ★ **ASHLAND, OHIO**


Coöperate WITH NATIONAL
FUEL CONSERVATION PROGRAM
WAR TIME SOLUTIONS
TO CONTROL PROBLEMS
Please send my free copy of "War Time Solutions to Control Problems"
Name
Address
City, State
Heating equipment represented

GET THIS VALUABLE HELP ON YOUR CONTROL SERVICE PROBLEMS

The Perfex Twins have some good news for heating equipment dealers who are plagued by labor and material scarcities. Here at Perfex, we have worked out a way to make servicing and replacement of controls easier for you. Our two-part plan concerns itself first with adding to your supply of

TECHNICAL HELP

We will send to any dealer requesting it a copy of a brand new booklet entitled, "War-Time Solutions to Control Problems." This book is chock-full of information and suggestions on how to make available controls do the work of unserviceable units which no longer can be duplicated. It contains many extremely helpful wiring diagrams as well as complete descriptions of Perfex-built controls which you can obtain now for repair and replacement jobs. Experienced as well as inexperienced service men will find real help in this book.

The second part of our plan has to do with helping you get necessary controls.

Priority regulations and manpower shortages have made it difficult for many heating equipment manufacturers to keep dealers supplied with sorely-needed controls for repair and replacement. These difficulties are being overcome, and most manufacturers will therefore be in a position to supply controls as needed.

Should you be unable to secure what you require through your regular channels, we invite you to get in touch with us at Milwaukee.

JUST DO THIS

So if you want some really valuable help on that tough job of yours, including some basic instruction material for inexperienced service men, send the coupon for your copy of "War Time Solutions to Control Problems." It will be supplied promptly and without cost to you. Clip that coupon — now.

PERFEX CORPORATION

300 West Oklahoma Avenue, Milwaukee 7, Wisconsin

ALL STEEL COILS

To save the more critical materials, it became necessary to make Heating and Cooling Coils of steel. . . . Aerofin tackled the problem and, in its thorough way, spent days of research in the developing of the most efficient and durable Coil possible. . . . The construction of the *Aerofin All Steel Coils* is such that it will meet with the approval of all engineers.

CONSTRUCTION

Heavy wall tubes (.049" thick). Complete solder coating over the outside of the tubes and fins (preventing external corrosion and effecting a permanent bond between tubes and fins). Brazed joints between tube and header. Piping connections welded to headers. Heating coil tubes offset to relieve expansion strains.

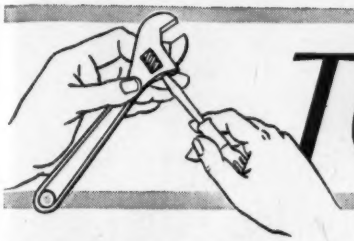
All such details were worked out to make *Aerofin All Steel Coils* give the maximum results under wartime conditions.

AEROFIN CORPORATION

410 S. GEDDES ST., SYRACUSE, N. Y.

Chicago Detroit New York Philadelphia

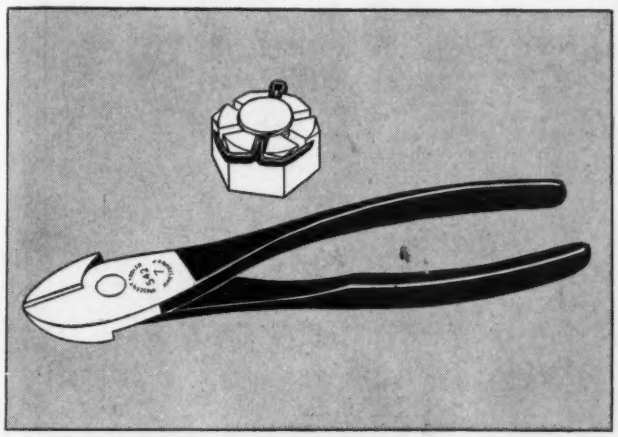
Dallas Cleveland Toronto



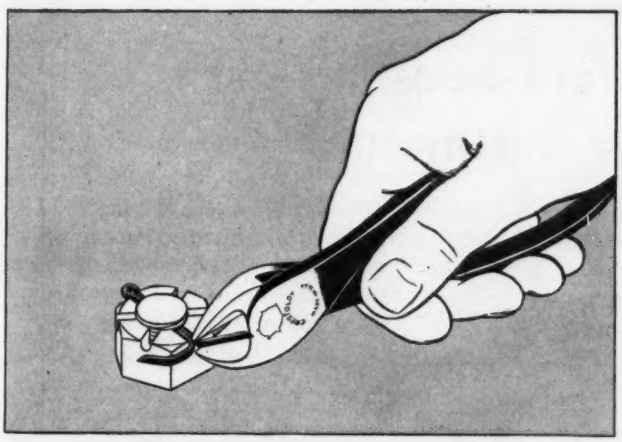
TOOL NOTES

"How To Do It" Information For Crescent Tool Users

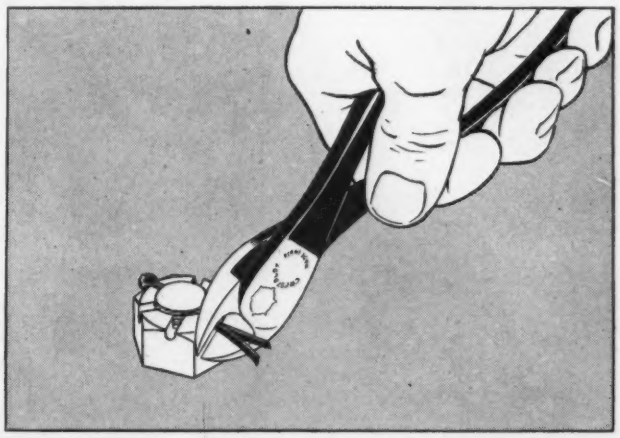
No. 13 . . . . . HOW TO REMOVE COTTER KEYS



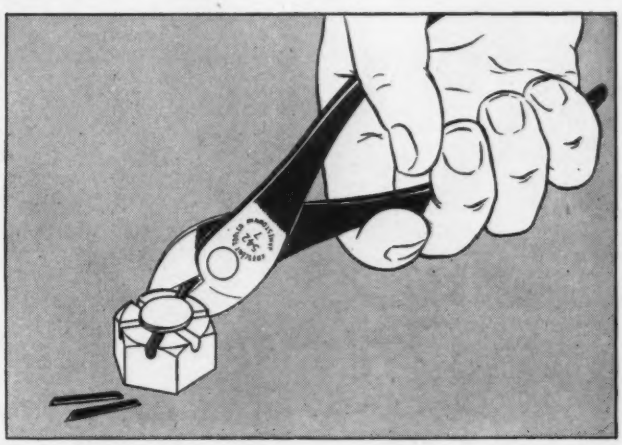
The following is a simple, effective and workmanlike method of removing cotter keys. It is not safe practice to reuse these keys and this method makes it impossible. Crescent's Heavy Diagonal Pliers, No. 542, should be used for this purpose.



First, straighten out the spread ends sufficiently to permit cutters to "bite" both pieces at one time as shown in following illustration.



With cutters close to nut, as shown above, sever spread ends with a single cut.



Now grip the head or "eyed" end of the cotter key as shown above and with a sideways motion, pry the cotter key out. *Don't attempt to pry it out without first cutting off the spread ends.*

MAIL THE COUPON . . . for Free Reprints of this series of informative ads. Please indicate whether you want them for bulletin board use, or punched for 3-ring binder.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

CRESCENT TOOLS
Give Wings to Work

Crescent Tool Co., Jamestown, N. Y. D-1
Please send your "TOOL NOTES" Series
☐ for Bulletins ☐ for 3-ring binder

Name _____

Address _____

City _____ *State* _____

THESE ADS TELL MILLIONS ABOUT DUST-STOP* ADVANTAGES.
AND THESE DUST-STOP DEALER HELPS HEAD PROSPECTS RIGHT TO THIS STORE.
WHY LET YOUR FURNACE ROB YOU OF FUEL?
KEEP YOUR FURNACE WASTING FUEL
Before you start to plant—
Don't let cold weather catch you
with a furnace
FIBERGLAS*
DUSTOP*
IR FILTERS
OPEN UP BLOWER CABINET—FILTERS ARE INSIDE.

Dust-Stop's biggest profit-boosting plan gets under way this month

YES SIR, it's the biggest . . . the most complete and timely profit plan Dust-Stops ever offered—a plan that's just made to order for present-day conditions. Here's the story . . .

Most of your prospects realize the importance of keeping their heating equipment in tiptop condition. Certainly, they don't want to risk wasting fuel this winter. So now comes Dust-Stop with a fuel-saving plan that is bound to appeal to every forced-warm-air furnace owner in your community.

National Advertising starts this month

Your customers will likely insist on having their equipment attended to well ahead of time this year. The facts about Dust-Stop Air Filters are, therefore, being told right now through attention-getting advertisements in *Saturday Evening Post, Life, American Home, Better Homes and Gardens, and House Beautiful.*

This advertising will be seen by the majority of the prospects in your community. And, it will continue all through the remainder of the year.

Plus a New Free Dealer Help Campaign

And now, to help you tie in with this national advertising, comes the greatest Dust-Stop Dealer Help Campaign ever offered.

Here are attractively designed mailing pieces, return post cards, newspaper ad mats, counter displays, radio scripts . . . everything to identify your place of business with the national advertising.

Many dealers have already reported excellent Dust-Stop results from the Spring Dealer Helps. But the prospects for profits this Fall are even brighter. And remember, this campaign not only brings you Dust-Stop replacement business, but it puts you first in line for all kinds of furnace repair and cleaning work.

So, if you have not already sent for the big 1943 free Dealer Help Campaign, get in touch with your distributor today. Ask him for complete information about "Pulling Profits out of the Air." *Owens-Corning Fiberglas Corporation, Toledo, Ohio. In Canada, Fiberglas Canada, Ltd., Oshawa, Ontario.*

FIBERGLAS*
DUSTOP*
*T. M. Reg. U. S. Pat. Off.
AIR FILTERS

GREAT NAMES in American Progress

ROBERT FULTON, BOAT BUILDER — On a fateful Friday in 1807, a skeptical crowd gathered at the foot of Cortlandt Street, New York. They came to watch "Fulton's Folly" attempt the "impossible" by traveling without sails from New York to Albany. Those who came to jeer stayed to cheer. "Crazy" Bob's puffing, snorting Clermont wheezed away from the jetty and grunted upstream against the wind at the miraculous speed of four miles an hour. On that day, Robert Fulton, well-nigh penniless dreamer, revolutionized the water-borne transportation of the world.

AMERICAN BLOWER

American Blower products have contributed much towards the progress of American industry — progress that today is making it possible for America's vital industries to outproduce the world. In the great public utilities, the steel industry, in the manufacture of petroleum products, chemicals, in food processing, mining, smelting and refining, in hospitals, schools, public buildings and homes, American Blower air handling equipment has kept pace with progress.

Utility Set

CONTRACTORS—DEALERS— We're working 100% for victory. But you can still buy American Blower products for vital war work. After victory we'll be ready with the most complete line of heating, ventilating and air handling equipment in history.

ARMY E NAVY

For excellence in production

AMERICAN BLOWER CORPORATION, DETROIT, MICHIGAN
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO
Division of AMERICAN Radiator and Standard Sanitary Corporation

Moncrief

Durable, Efficient, Reliable

Coal Burning, Hand Fired Furnace

INTO the MONCRIEF Series C cast iron furnaces have been built all the latest, most modern and practical heating features that have been developed in almost 50 years of quality furnace building.

Today, as always, the MONCRIEF furnace has the advantage of excellent design, and sound, honest construction.

Today, when production cannot keep apace with the demands of furnace buyers, there is no deviation in the high MONCRIEF standards of manufacture.

GENUINE MONCREIF REPAIR PARTS

Special attention is being given, this season, to the production of Replacement Parts. Every effort will be made to maintain a complete stock of Genuine MONCRIEF Replacemnt Parts, so that all demands can be met.

Genuine MONCRIEF Repair Parts fit better, are installed more quickly and easily—and they last longer.

You can increase your profits this year, when the repairing of furnaces will be a major part in your business, by using Genuine MONCRIEF Parts.

WARM AIR FURNACES FURNACE PIPE AND FITTINGS

MONCRIEF

THE HENRY FURNACE CO., MEDINA, O.

AIR CONDITIONING SYSTEMS FOR COAL . . . GAS . . . OIL

Augustus Hall couldn't have a better reason for going "All out for Victory"

Staff Sergeant Arthur Hall, U. S. Army Air Corps, formerly in Aircraft Parts Assembly Dept., The American Metal Hose Branch of The American Brass Company, and his Dad, Augustus Hall, accountant in the Timekeeper's Office, see eye to eye on doing the best possible job today so that victory will be that much closer tomorrow.

It would be difficult to find a man who realizes—better than Augustus Hall does—the importance of all-out war production.

Himself a veteran of the first World War, "Gus" has only to think of his son, Arthur, U. S. Army Air Corps . . .

This Hall father-son "incentive" isn't at all unique at American Brass. For thousands of other workers here have a similar *added stimulus* to produce, quickly, the finest possible copper and brass war material for their sons, brothers, relatives and fellow workers . . . to *help* them win their battles . . . so *they* can come home sooner. That's the motivating spirit in every plant operated by The American Brass Company—of which all ten U. S. A. plants fly the Army-Navy "E".

Individually and as a nation, the American people are united in fighting this war—on the battle front and the home front . . . buying War Bonds . . . donating blood . . . conserving critical materials—and giving their lives.

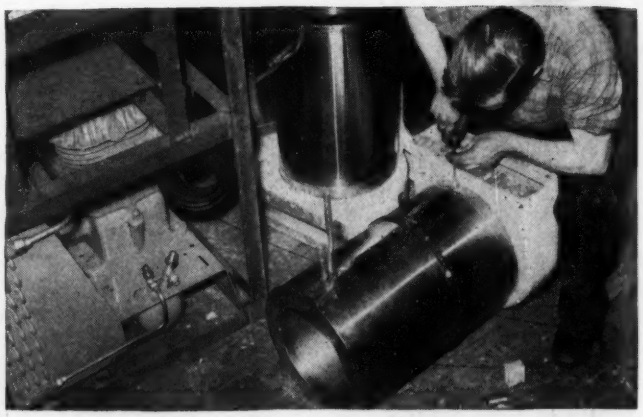
To Sheet Metal Men:

Sheet metal workers, despite present lack of copper, can look forward to increased use of this old standby metal when peace comes. There'll be more extensive flashing applications in all types of construction. Among them, for example, will be termite shields, as well as the many sheet metal uses where the durability and workability of copper have made it such a favorite with the trade. 4348C

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: Anaconda American Brass Ltd., *New Toronto, Ont.*

ANACONDA **Anaconda Copper & Brass**

DO YOU KNOW ALL *these Fastening "Short Cuts"?*



THIS ONE'S A NATURAL...

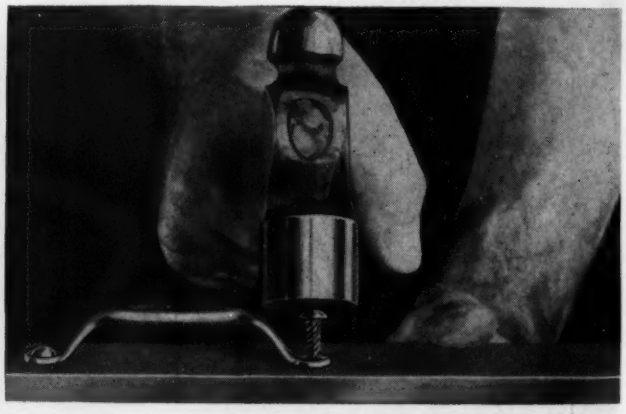
TYPE "A"

There is nothing unusual in the choice of Parker-Kalon TYPE "A" Sheet Metal Screws for this job, except that the screws are stainless steel. Five are used to fasten the 18 gauge stainless steel jacket to the inside cylinder of 20 gauge galvanized iron on each of these freezers being made for the armed forces. It's the tried and true fastening any sheet metal worker would select.

BUT, HERE'S A NEW WRINKLE...

TYPE "F"

P-K TYPE "F" Screws, which *cut standard machine screw threads* as they are driven, are used to assemble 16 gauge and 22 gauge galvanized iron units for a ship ventilating system. Normally, this would be a better job with Type "A" or "Z" Screws, but with Type "F", replacements can be made with ordinary machine screws if no P-K Screws are available.



AND, FOR PERMANENT FASTENINGS...

TYPE "U"

There is nothing simpler, nor more dependable than P-K TYPE "U" Drive Screws for fastening sheet metal sections or any units to castings, steel, or plastics. They form their own threads as they are hammered into a plain hole in the material. Use them whenever you need a permanent fastening that will hold securely in spite of heavy stresses or severe vibration.

★ ★ ★

HEX HEAD

TYPE "Z"

SEVEN different types of P-K Fastening Devices are ready to help you do your work the easiest way . . . do it better, too! Know them ALL . . . tell us what you want to fasten and we'll send free samples for a trial. Parker-Kalon Corporation, 190-192 Varick Street, New York.

MASONRY NAIL

SCREWNAIL

PARKER-KALON *Quality-Controlled* **Self-tapping Screws**

BOMBS! PICTURES! MORE BOMBS

This is the story of how a sheet metal you know—ARMCO Galvanized PAINTGRIP—is helping to win the war on the "picture front."

An enemy stronghold is heavily bombed. What's the damage? Aerial cameras soon tell the story. Thirty minutes after the big bomber lands, the photographs give up their tell-tale evidence—thanks to this ingenious roll-film dryer. *The operation once took three hours.*

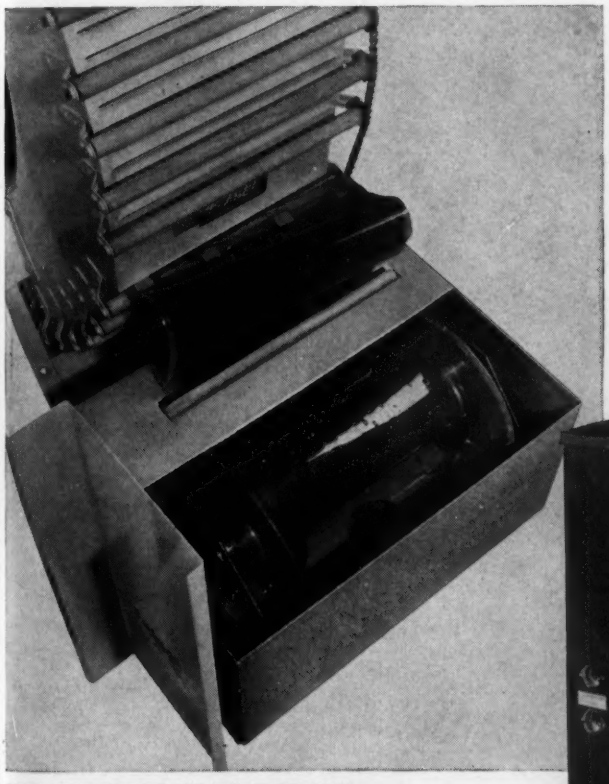


PHOTO COURTESY THE LAU BLOWER COMPANY

But time-saving is only one advantage. Critical alloys are saved too. The special forming grade of ARMCO PAINTGRIP replaces scarcer metals on all structural parts. Top and sides are painted inside and out to assure long, trouble-free service in all kinds of climates.

Someday PAINTGRIP will come back to your shop, to help you get money-making jobs that please your customers. You'll be glad to use it for all galvanized work that must be painted immediately and *hold the paint.*

Meanwhile, like all other ARMCO *special purpose* metals, it is working for Victory—for the day when you can run your shop in the good old American way. The American Rolling Mill Co., 2281 Curtis St., Middletown, Ohio.

MADE OF ARMCO GALVANIZED PAINTGRIP

THE AMERICAN ROLLING MILL COMPANY

Pure "MOUNTAIN-FRESH" AIR

Clean, efficient Detroit Filters will assure your customers an abundance of pure "mountain-fresh" air in their homes.

And clean, efficient Detroit Filters will save your customers' fuel supply, a necessity in these days of fuel shortages.

Right now is the time to replace Air Filters. With the winter three-quarters gone, filters are loaded with the dirt of several months' operation. But winter isn't over. Furnaces will operate for many weeks to come.

Replace clogged filters with Detroit Filters—and build good-will and profits for yourself.

When filters need replacing, be sure to ask your local jobber for "Detroit" Air Filters, and take advantage of these desirable features.

ECONOMY—Patented cellular design gives more filtering capacity per dollar.

FREE AIR FLOW—Uniform air distribution assures free flow with maximum filtering.

DUST CAPACITY—Thoroughly impregnated with special non-dripping compound to retain dust collecting ability indefinitely.

ODORLESS—Adhesive material is absolutely odorless and will not turn rancid.

LONG LIFE—Entire thickness of filter used in cleaning, thus providing long and efficient filtering.

***STRENGTH**—Selected materials and sturdy construction prevent sagging. No danger of small particles being carried into air stream.

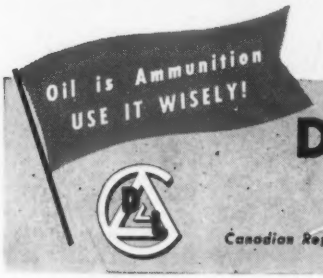
POLLEN—Highly effective in providing relief for persons allergic to air-borne pollen.

CLEANING—Guaranteed factory cleaning and renewal service when necessary—a further economy.

**No critical materials are used in the construction of "Detroit" Air Filters.*

Made in all standard sizes —special sizes to order.

An attractive envelope stuffer is available—imprinted with your name—a powerful stimulant for replacement filter business. If you want some to mail out to your customers, drop us a line on your letterhead.

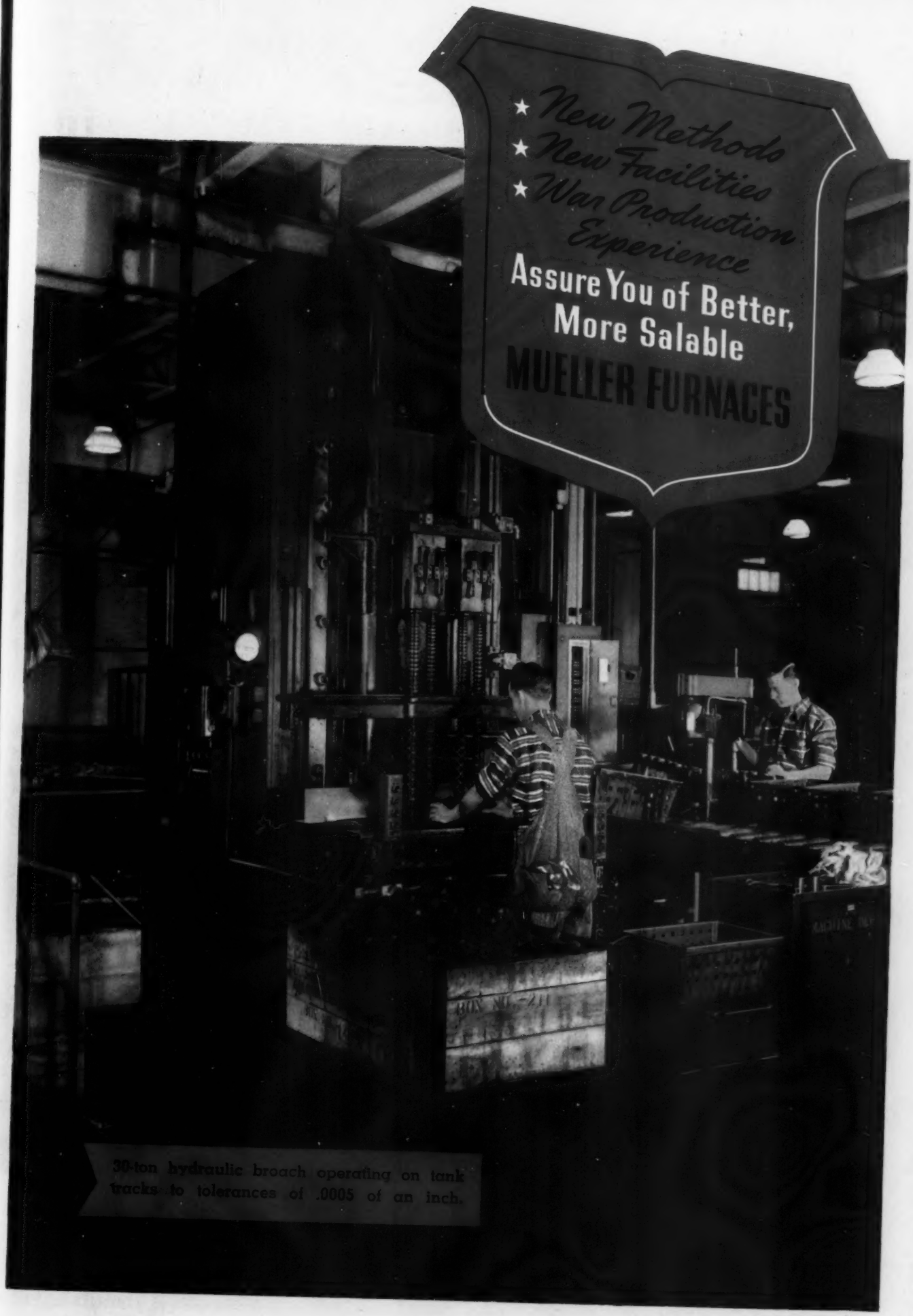


DETROIT LUBRICATOR COMPANY

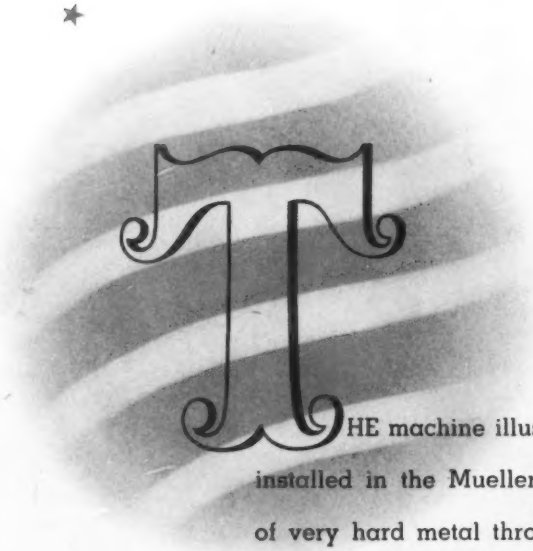
General Offices: DETROIT, MICHIGAN

Division of AMERICAN Radiator and "Standard" Sanitary Corporation

Canadian Representatives—Railway and Engineering Specialties Limited, Montreal, Toronto, Winnipeg



30-ton hydraulic broach operating on tank tracks to tolerances of .0005 of an inch.



The Army Ordnance Banner — awarded to Mueller for outstanding performance in war production.

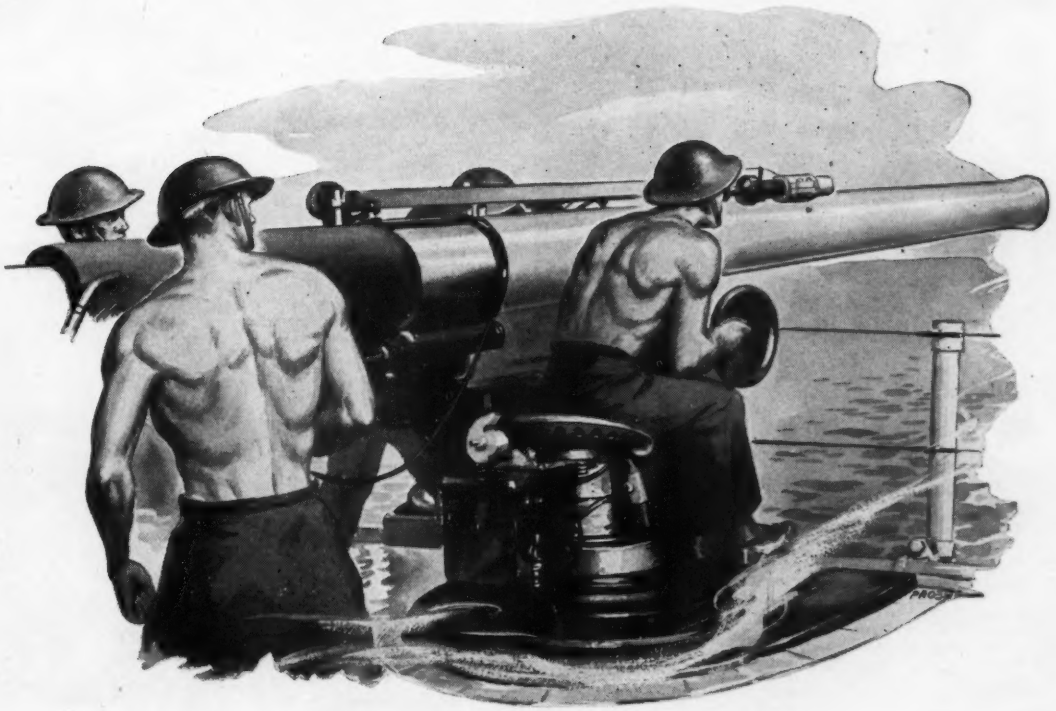
THE machine illustrated on the preceding page is one of the new broaches installed in the Mueller plant. Broaching is a process of forcing a round tool of very hard metal through a previously drilled hole in order to produce a finished hole of extremely accurate diameter. This machine broaches four holes at one time and is capable of turning out hundreds of pieces per hour. A hydraulic pressure of 60,000 pounds is required. The machine has been operating 24 hours a day, 7 days a week. Huge stock piles of material must be maintained in order to keep this machine in continuous operation.

★ ★ ★

The war-time advances in Mueller manufacturing ability and equipment are a promise to you of corresponding advances in the design and manufacture of Mueller heating equipment when peace-time production is resumed.

L. J. MUELLER FURNACE COMPANY
2005 West Oklahoma Avenue, Milwaukee 7, Wisconsin

MUELLER *Milwaukee*
HEATING AND AIR CONDITIONING



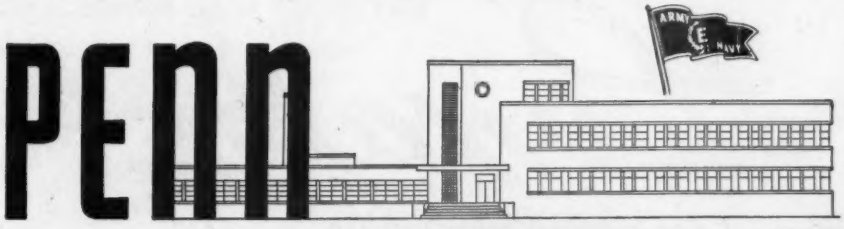
HERE'S HOW YOU'RE HELPING NAVY GUNNERS TO "DISH IT OUT"

In a split-second after steel-nerved men at our navy guns get the range, shells go crashing toward the enemy target. The guns have been stung to action by an electric trigger switch!

Instant... unfailing response to the gunner's touch must come from the firing control circuit—a "harness" of electric cables, junction boxes, snap switches, transformer, fuses and solenoid mounted on each gun. The fate of a ship and its crew... perhaps the safety of a convoy... or even the outcome of a battle may hang on the speed and dependability of these electric controls.

Part of our work for the armed forces is to supply these lighting and firing circuits for the Navy's 3" and 5" guns. Because our skilled workers and critical materials must meet this urgent need, we can make only a limited number of automatic controls for civilian requirements.

The loss of business which you dealers have suffered... the Penn controls you are unable to get ... your extra efforts to make existing equipment continue to function—all this helps make it possible for Navy gunners to "dish it out." And *our experience in meeting the exacting requirements of battle-worthy equipment will be reflected in still better Penn controls* for the tremendous post-war market. *Penn Electric Switch Co., Goshen, Indiana.* In Canada: Powerlite Devices, Inc., Toronto, Ont.



PENN

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

Berlin-TOKIO BOUND

THE Allied Nations now have on the move the greatest armada of Air, Sea and Land Power in the history of the world . . . BERLIN-TOKIO BOUND.

Among this greatest combination of the world's most modern fighting equipment, built in the world's arsenal, AMERICA, are items and parts of which we at Luxaire are specially proud. They were made and fabricated in the large, modern LUXAIRE furnace plant in Elyria, Ohio.

The foe are on the move, so we at home must set the pace with ever-increasing production to keep them moving, to keep this armada at the gigantic proportions it has reached.

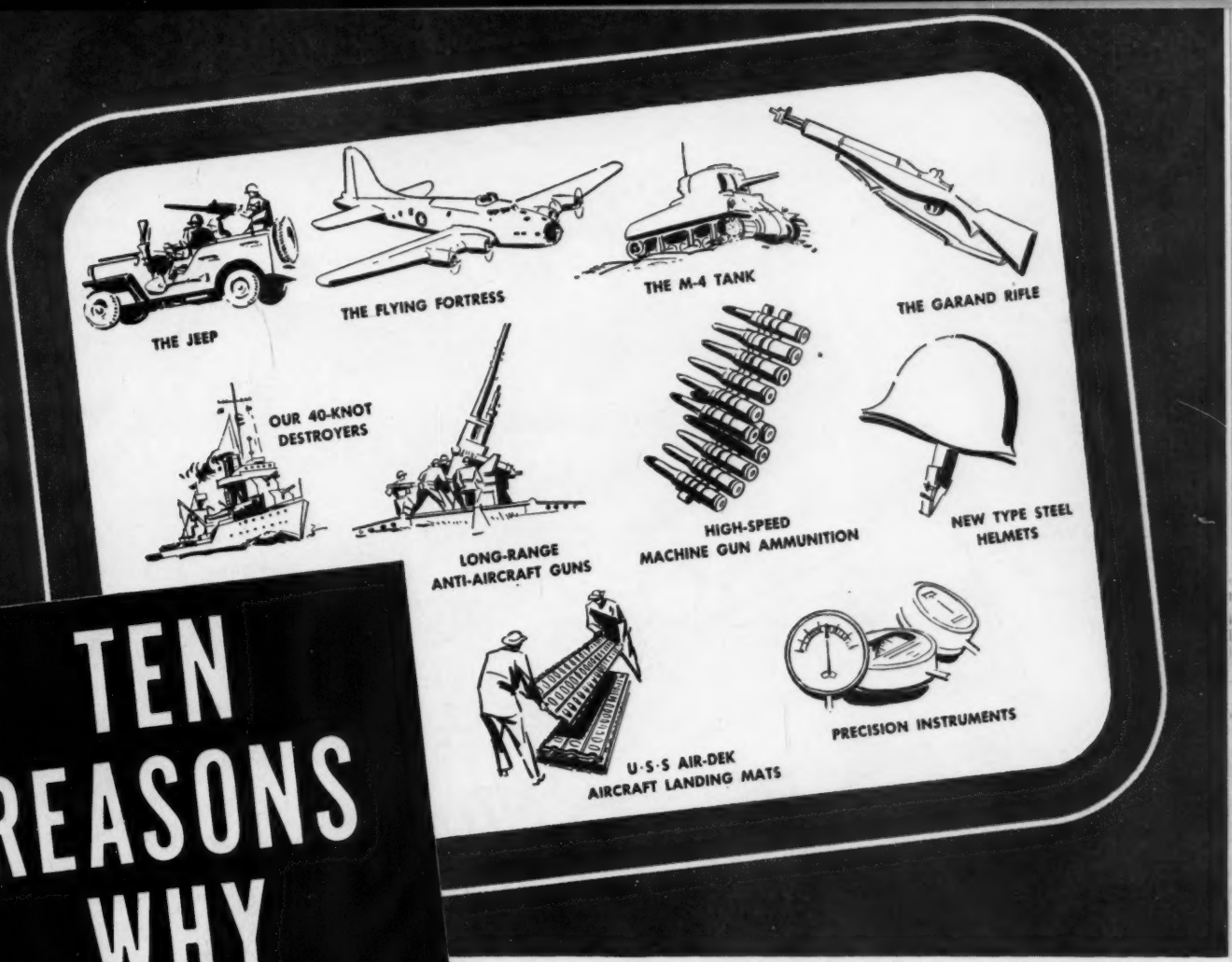
Our large, modern Luxaire furnace plant is contributing more and more to this equipment, which eventually will enable the flags of the Allied Nations to fly over Berlin and Tokio.

BUY MORE WAR BONDS AND STAMPS

Luxaire

WARM AIR FURNACES . . . AIR CONDITIONING UNITS . . . COAL . . . GAS . . . OIL

THE C. A. OLSEN MANUFACTURING CO., ELYRIA, OHIO



TEN REASONS WHY

. . . your customers will be "steel-minded" after the war!

REMEMBER how rapidly public preference for products of steel was growing at the time war came? People were learning to appreciate the advantages of steel's strength, its good looks and enduring qualities. Now that the uses of metal are so limited, perhaps you've felt concern that you might lose the ground you had gained in building a ready market for your steel craftsmanship. Don't worry! Your customers will be more "steel-minded" than ever after the war!

No one can forget steel in wartime. Almost daily Mr. and Mrs. America read about some new accomplishment of steel, in the form of a tank, a destroyer or a deadly anti-aircraft gun. Or their boy at the front writes how his lightweight steel helmet stopped a Nazi bullet, how he landed his bomber on a steel airfield, or how he crashed through the jungle in his rugged steel "jeep."

Yes, steel's performance is impressing people everywhere . . . and we're stimulating this appreciation by using our advertising to dramatize important war products resulting from U·S·S research. When the fighting stops, you won't have to sell very hard to convince your customers that steel deserves their first consideration . . . and that they can depend on the U·S·S Label as their guide to quality.

U·S·S Steels for Successful Sheet Metal Workmanship

U·S·S GALVANIZED STEEL for sheet metal structures requiring the added protection of a zinc coating

U·S·S COPPER STEEL to give twice the atmospheric corrosion resistance of regular steel at little additional cost.

U·S·S PAINTBOND — A galvanized, Bonderized sheet that permits immediate painting and holds paint tighter. U·S·S Dul-Kote, a product with similar qualities, available in the South and West.

U·S·S HOT-ROLLED AND COLD-ROLLED STEEL to provide the basic advantages of steel, plus maximum economy, in accordance with the needs of each individual job.

U·S·S STAINLESS AND HEAT-RESISTING STEELS to assure high resistance to corrosion and heat, and to reduce weight.

U·S·S VITRENAMEL — Sheets designed especially for porcelain enameling.

U·S·S LOW ALLOY, HIGH TENSILE STEELS to resist corrosion and increase strength-weight ratio.

U·S·S STEEL SHEETS

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

ONE AIM VICTORY! BUY BONDS

UNITED STATES STEEL

3 Months to Go--

GET AN EARLY START ON HEATING REPAIR WORK...

If you haven't already done so, you'll be wise to start your furnace repair and replacement business now. We suggest this for two important reasons.

First, the heating season is less than ninety days away and you should allow more time than usual to obtain necessary parts and materials. As you know, these are not as readily available nowadays as in peacetimes.

Secondly, your homeowner customers will welcome a reminder from you to put their heating plants in condition. Some have forgotten that their furnaces just squeezed through the last winter; others don't realize that materials and labor are "tight". None, however, want to sacrifice comfort or endanger their health this winter because of broken-down or inefficient heating systems.

A post card or telephone call to your customers this week will give you a head-start on this work—help reduce the number of rush calls when cold weather comes—and will avoid many disappointments if materials conditions get worse.

PRIME METAL SHEETS
EAVES TROUGH, CONDUCTOR PIPE, ETC.
ROOFINGS, NAILS AND PAINTS
FURNACES AND ACCESSORIES
SHEET METAL TOOLS AND MACHINERY

THE J. M. & L. A.
OSBORN Co
CLEVELAND, OHIO
BUFFALO • CINCINNATI • DETROIT
Manufacturers—Distributors of Metals and Metal Products

A DEPENDABLE SOURCE OF SUPPLY FOR 84 YEARS

Vol. 112 American Artisan No. 8

We Need "Concrete" Help From Washington

EVER since April 11, 1942, when the original furnace limiting order L-22 became effective, the warm air heating industry has been warning Washington agencies that unless essential civilian heating equipment needs were thoroughly and correctly analysed and proper steps taken to meet these needs, there would come a time when civilians would suffer.

Unless a miracle happens, that time is going to be this coming winter.

In this issue AMERICAN ARTISAN publishes an unexpurgated analysis of the furnace situation as it stands right at this moment.

The highlights of the situation are starkly worrisome.

We must produce and install before the end of the year some 22,000 furnaces of the 60,000 Btu size, ordered earlier, but not yet manufactured for war housing let to contract months ago.

In addition, the housing agencies propose to let to contract some 32,000 additional war worker housing which will need coal, oil, gas, gravity and forced, cast iron and steel furnaces of the same 60,000 Btu size.

For essential civilian housing of the dormitory type and such the industry has been told an additional 7,000 furnaces of capacities greater than 60,000 Btu will be ordered before January 1.

The canvass of furnace manufacturers shows that they can produce the first 22,000 and also at least 25,000 of the 32,000 to come and with some ingenuity the full 32,000 to come—providing steel furnace manufacturers get the material to produce at their maximum capacity.

The same canvass showed that the industry can produce fewer than 100,000 furnaces of all types and sizes, both cast iron and steel in the last five months, providing every manufacturer works at maximum capacity. Deducting 22,000 small furnaces ordered but not produced, plus 32,000 small furnaces to be ordered, plus 13,000 large furnaces for dormitories there remains available for replacement about 38,000 furnaces of all types and sizes.

For months contractors have been warning that many necessary furnace replacements will not be made this year because the contractor can't get a furnace. AMERICAN ARTISAN'S survey on pages following verifies this claim without any question.

The 38,000 furnaces which seemingly will be available for replacement will satisfy only a fraction of the actual needs.

It is too late now to say "I told you so." What we need desperately is some quick and concrete help from those agencies in Washington which are supposed to know all about such problems and to help industries faced with problems like ours.

Specifically, this industry needs these things—

1—Immediate allocation of as much steel for furnaces as the steel furnace manufacturers can turn into furnaces before January 1. There should be no question of ratings, allotments—it should be how much can you cut up—here it is.

2—If there is any way by which the cast iron furnace manufacturers can unload some of their high priority war work to resume manufacturing furnaces, somebody ought to help them unload.

3—Cast iron furnace manufacturers should be permitted to price their furnaces at a level which will compensate them for unloading profitable war work for less profitable furnaces.

4—All furnace manufacturers should be permitted to increase their wage rates so that they can hold labor against higher rates and overtime of the war plants. Essential workers should be really frozen in their jobs.

5—If the present blanket 9 per cent increase in cast iron furnaces recently permitted by OPA isn't enough to make manufacture profitable an additional increase should be permitted.

6—Dealers should be ultra-patriotic, making sure that every replacement made shall be *absolutely* essential—not just necessary.

7—The furnace dealers should be permitted to file manning tables as an industry in order to keep their essential employees. Even the armed forces should hesitate before taking a man who cannot be replaced as a furnace repair man or installer.

Necessary Replacement *Needs* Of 3,843 A. A. Readers

(Aug. 1 to Dec. 31, 1943)

IN THE last five months of this year (August 1 to December 31) warm air heating contractors who read AMERICAN ARTISAN need to meet *necessary* replacement and repair work in the 17 states constituting the big warm air heating area

100,000 cast iron, gravity, coal furnaces

30,000 steel, gravity, coal furnaces

240,000 firepots (cast iron)

370,000 grate bars

63,000 grate rings or supports

50,000 combustion sections (cast iron)

These minimum needs of this essential industry are indicated by projecting the reports from 107 contractors described and presented in preceding pages.

From the 107 reports itemized in the other table, the editors have projected the figures to show how many furnaces and parts are needed in the states covered by the survey.

To make this projection the following method was used. The number of furnaces by types, or the number of grate bars, or firepots, etc., needed by the contractors reporting in each state was divided by the number of contractors reporting in that state to get an *average* for each contractor reporting. Then this *average* was multiplied by the number of AMERICAN ARTISAN readers in that state to obtain the total need for the state.

Admittedly, such a projection has some shortcomings. 1) Not all contractors in any state are ARTISAN readers. Therein our figures are less than the true total. 2) There is no such thing as an *average* shop so in states with only one or two reports the average is not average—truly.

Nonetheless, if our reader averages are greater than the true contractor average this should be balanced by there being more contractors in a state than ARTISAN readers. Further, cities with several reports and states with many reports are in pretty close agreement, average-wise, with the cities and states with few reports.

Space does not permit projection of every column in the Survey. But readers may make their own projection from the figures in the Survey using the method described. (See pages 28, 29, 30).

State	Number of Cont'r's Reporting	Number of A.A. Cont'r Readers	Number of Coal, Gravity Needed: Cast, Gravity, Coal Reported	Cast, Gravity, Coal Needed in State	Steel, Gravity, Coal Reported	Steel, Gravity, Coal Needed in State	Repair Parts Needed: Firepots Reported	Firepots Needed in State	Grate Bars Reported	Grate Bars Needed in State	Grate Rings Reported	Grate Rings Needed in State	Combustion Sections Reported	Combustion Sections Needed in State
Colorado	2	54	32	864	8	216	45	1,215	306	8,100	60	1,620	.....	.....
Connecticut	2	75	16	600	4	150	15	563	80	3,000	11	413	.....	.....
Idaho	1	12	.....	.....	.....	.....	15	180	25	300	.....	.....	3	36
Illinois	25	515	530	10,815	102	2,101	1,044	21,527	1,222	25,235	241	4,965	366	7,540
Indiana	9	270	161	4,860	56	1,679	370	11,099	705	21,160	123	3,690	122	3,702
Iowa	13	160	206	2,536	80	984	263	3,236	639	7,840	62	768	85	1,046
Michigan	9	318	204	6,996	74	2,544	295	10,494	590	20,670	110	3,880	70	2,544
Minnesota	1	150	.....	.....	50	7,500	260	39,000	185	27,750	100	15,000	6	900
Missouri	5	180	247	8,820	12	360	582	20,880	824	29,700	67	2,412	141	5,076
Montana	1	18	.....	.....	.....	.....	12	216	48	864	24	432	12	216
Nebraska	4	75	42	750	5	80	460	8,625	1,150	21,562	145	2,775	150	2,775
Nevada	1	9	25	225	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New York	7	351	430	21,411	46	2,106	125	6,318	290	14,040	32	1,755	26	1,404
Ohio	19	507	941	25,350	342	9,126	2,355	62,868	4,220	112,554	567	15,210	699	18,252
Pennsylvania	4	375	130	12,000	20	1,875	440	41,250	670	62,625	60	5,625	58	5,250
Utah	2	27	55	729	30	405	300	4,050	400	5,400	400	5,400	50	675
Wisconsin	2	261	30	3,915	10	1,305	45	5,742	76	9,918	.....	.....	5	522
	107	3,843	3,049	99,871	839	30,431	6,626	237,263	11,424	370,718	2,002	63,945	1,793	49,938

American Artisan Heating Equipment Survey

ON THE three pages following, American Artisan presents a study of the heating equipment requirements of 107 typical warm air heating contractors in 17 states and 80 communities.

Because of space limitations the study is restricted to certain states, although in compiling data questionnaires were mailed to all states in which warm air heating in any form is popular.

Some 500 questionnaires were mailed. Inadvertently, quite a few reports came back with insufficient data and such reports were discarded. It is felt, however, that the 107 reports published are a fair cross section of the industry and present a fair analysis of the needs of contractors doing heating work.

The editors feel that these reports are fair because—

1. Both large cities and small towns are included.
2. Both populous states and sparsely settled states are included.
3. Reports include large operators in large cities; small operators in large cities; typical small city contractors.

Following are certain interesting data which the editors would like readers to consider.

We Are Patriotic

The study reveals a large preponderance of cast iron, coal burning, gravity furnaces needed. This can be interpreted two ways. First, this industry is patriotically trying to live up to the requests to conserve materials; to use least critical metals; to replace with the simplest possible furnaces.

Secondly, we think, the total of 3,202 cast iron, coal fired, gravity furnaces needed for replacement indicates that most homes, by far, are heated with furnaces of this type. Conversion to oil, gas, stokers and to forced air still is and will be in the post-war era a tremendous field for this industry's sales efforts.

Old Furnaces Wearing Out

If the great need, as shown, is for coal burning, gravity, cast iron and steel furnaces—especially for cast iron furnaces, it would seem to follow that it is the old furnaces which are wearing out. In other words, steel furnaces are relatively new, therefore it should be the much older cast iron furnaces which are now coming to the end of their usable life and this seems indicated by the reports.

The reports do not show any great need for replacement forced air furnaces, indicating, perhaps, that these furnaces are relatively new and still have many years of useful life ahead. Also, oil furnaces were pretty largely forced air and cannot be over-fired, so they should show long life. The same is probably true of gas fired furnaces.

Sizes Needed

Contractors were asked to specify the sizes needed. The column on required sizes indicates that 22, 24, 26-inch furnaces are most needed and that the few larger sizes possibly can be satisfied by one size, such as 30 inch.

Delivery Delays

One of the alarming columns shows the time the contractor now must wait to get delivery on furnaces. While some contractors are still getting 5 to 10 days' delivery, there are also many, many 30, 60, 90-day delays reported. This, definitely, is not a healthy condition. When a furnace needs replacement, delay is often dangerous—can be criminal.

If home owners would give the contractor several weeks in which to get and install the furnace, this might not matter so much. If the contractor could service all his customers early in the spring, the delay would not be so serious. But both of these conditions are wishes—not actualities.

Casings

During 1943, many reports have reached us that casings were either hard to get or slow in coming through. The reports show that most manufacturers are still furnishing casings (sometimes without liners) and sometimes of black iron, but the contractor does not yet have to plan on building his own casings.

Repair Parts

The number of repair parts of all types reported needed is astounding. Firepots and grate bars in the hundreds, even hundreds of sets of bars, appear time and again through the tabulation.

And there is a surprising number of grate rings needed. Perhaps of all repair parts, grate rings are truly hard to get. Yet more than 2,000 of these are needed by 107 contractors.

Even seldom needed parts like doors, frames, radiators show better than six to eight pieces to the contractor. And combustion chambers, which some have claimed never wear out, average almost twenty chambers per contractor.

Who's Delivering Furnaces?

Previous Artisan surveys have disclosed the rapid and widespread shifting of dealers from one manufacturer to another at all times. But the 107 contractors covered in this survey show that 41, or roughly 40 per cent, have had to get furnaces from manufacturers other than their customary source of supply. Several others reported that while they still get some furnaces from their customary manufacturer, they must fill in with furnaces from others.

Manpower

The last three columns of the report disclose a discouraging and alarming story. The first of the three columns shows the number of men employed today. A very rough average shows that there are only half as many men employed now as in normal times. The others have been lost to the armed forces, war plants, etc.

But an even more serious comparison is shown by the first and the third column where the men the industry needs right now are tabulated. In many cases no great increase in manpower over normal times is shown, but considering that contractors have fewer furnaces to work on, it appears that there is a tremendous volume of repair work crying to be done and no men to do it. In short, we need as many men this Fall as in a normal year; there are fewer furnaces to install; these men must be needed for service and repair.

AMERICAN ARTISAN'S SURVEY OF HEATING NEEDS*

*Each entry represents a report from one individual contractor and does not indicate the total need of the city shown.

Furnaces Needed for Necessary Replacements—Aug. 1 to Dec. 31, 1943

City and State	Coal, Cast Iron: Gravity	Coal, Cast Iron: Forced Air	Coal Steel: Gravity	Coal Steel: Forced Air	Oil, Cast Iron: Gravity	Oil, Cast Iron: Forced Air	Oil, Steel: Gravity	Oil, Steel: Forced Air	Gas, Cast Iron: Gravity	Gas, Cast Iron: Forced Air	Gas, Steel: Gravity	Gas, Steel: Forced Air	Sizes Required, Inches or Btu	Days Required for Delivery	Where Must You Get Furnaces? Regular M'fr	Other M'fr	Can Your M'fr Supply Castings	REPAIR PARTS (Number of Parts Needed Aug. 1 to Dec. 31) Firepots	Grate Bars	Grate Rings	Radiators	Doors	Door Frames	Combustion Chambers	MANPOWER Men Working Now	Normal Working Force	Men Could Work
COLORADO																											
Colorado Springs	12	5	3	3	..	..	..	..	..	..	..	..	20, 22, 24, 26	60-90	√	..	Yes	25	100	10	..	..	..	..	28	40	40
Denver	20	..	5	..	..	..	..	..	..	..	..	..	20, 22, 24	14	√	..	Yes	20	200	50	..	5	5	..	9	30	9
CONNECTICUT																											
Hartford	16	3	4	2	..	..	..	..	..	..	..	..	20, 22, 24, 26	14	..	√	Yes	10	50	7	6	..	10	..	3	18	10
Waterbury	..	20	..	..	..	..	..	..	..	..	..	..	22, 24	60	√	..	Yes	5	30	4	..	3	3	..	2	4	5
IDAHO																											
Twin Falls	..	10	..	10	..	..	..	5	..	..	..	..	20, 22, 24	30	√	..	Yes	15	25	..	1	2	2	3	4	12	6
ILLINOIS																											
Aurora	12	3	4	2	2	2	..	..	..	..	..	..	22, 24, 26	40	√	..	Yes	15	20	..	..	6	6	10	..	..	..
Barrington	6	..	1	..	1	..	..	2	..	..	..	..	24	7	√	..	Mostly	12	25	..	3	5	5	..	4	7	6
Berwyn	30	3	..	..	..	..	..	2	..	..	..	1	24, 26, 30	10	..	√	Yes	50	30	2	..	20	20	10	5	8	8
Chicago	5	..	5	..	..	..	..	..	..	..	..	..	24, 26	10	..	√	Yes	40	50	5	..	4	4	10	1	6	6
Chicago	10	..	..	..	..	..	..	..	..	..	..	..	22, 24	..	√	..	Yes	100	100*	50	5	10	10	50	2	4	4
Chicago	25	..	..	..	..	..	..	..	..	..	..	..	22, 24	150	√	..	Yes	120	100	50	..	3	..	30	2	7	2
Chicago	50	..	25	..	..	..	..	..	..	..	..	..	22, 24	30	√	√	Yes	50	100*	10	..	..	..	10	13	50	..
Danville	12	..	5	..	..	..	..	..	..	..	..	..	24, 26, 30	30-60	..	√	Yes	20	25	5	..	..	..	10	1	6	4
Decatur	20	..	..	..	..	..	..	..	..	..	..	..	22, 24, 26	30	..	√	Yes	60	40	..	2	15	10	20	3	7	8
East St. Louis	12	..	8	..	..	..	..	..	..	..	..	..	20, 22, 26	4	..	√	Yes	50	50	10	3	3	3	20	5	5	5
Elgin	5	..	20	..	..	..	..	..	..	..	..	..	22, 24, 27	..	..	√	Yes	20	40	10	2	..	20	10	3	6	5
Hinsdale	25	..	..	..	..	..	..	..	..	..	..	..	24, 26, 27	5	√	..	No	30	55	..	18	..	..	7	4	7	7
Jacksonville	15	5	10	..	..	..	..	..	..	..	..	..	24, 28, 30	50	..	√	No	20	50	..	5	10	10	15	3	6	6
Lincoln	30	..	..	..	..	..	..	..	..	..	..	..	22, 24, 27, 30	21	√	..	Yes	50	30	10	..	15	10	12	4	7	6
Macomb	15	10	5	..	4	..	3	..	..	..	3	..	24, 27	10	√	..	Black	15	50	10	5	5	5	6	1	2	2
Moline	35	..	..	..	..	..	..	..	..	..	..	..	22, 24, 26	35	..	√	No	20	45	10	4	5	3	15	3	8	8
Moline	75	..	..	..	..	..	..	..	..	..	..	..	22, 24, 26, 28	14	..	√	No	100	200	..	..	..	..	75	3	10	12
Monmouth	10	..	..	..	..	..	..	..	..	..	..	..	24	10	√	..	Yes	6	20	2	2	..	2	2	4	6	6
Naperville	10	2	5	..	..	..	..	..	..	..	..	..	22, 24, 26	90	..	√	Yes	8	12	5	..	..	..	3	1	4	3
Peoria	17	..	3	..	..	..	..	..	..	..	..	..	22, 24, 26, 28	60-90	..	√	No	15	20	..	..	..	..	6	3	5	5
Pontiac	15	..	5	5	..	..	..	..	..	..	..	..	24, 26, 28	90	..	√	Yes	15	25	..	3	5	5	10	5	10	5
Quincy	10	..	..	..	..	..	..	..	..	..	..	..	22, 24	30	√	..	Own	48	36	6	..	..	..	15	2	4	3
Quincy	6	..	..	..	..	..	..	..	..	..	..	..	22, 24	10	√	..	No	6	15	2	5	2	2	5	2	6	4
Rock Island	60	..	..	..	..	..	..	..	..	..	..	..	20 to 30	30	..	√	No	150	150	30	..	40	30	10	4	5	7
Wilmette	20	..	6	..	2	..	..	..	2	..	..	..	100,000	14	√	..	Yes	24	24	24	5	12	12	5	8	14	8
INDIANA																											
Auburn	15	..	..	..	..	..	..	..	..	..	..	..	24	14	√	√	Yes	50	100	15	5	5	5	25	6	10	10
Bloomington	10	..	..	..	..	..	..	..	..	..	..	..	24, 28	10	√	..	Yes	20	50	..	..	..	..	..	4	6	..
Ft. Wayne	30	..	10	5	..	..	..	5	..	..	..	..	20, 22, 24	60-90	√	√	Black	100	150	25	10	25	50	40	2	6	7
Hammond	18	..	2	..	..	..	..	..	..	..	..	..	22, 24	10	√	..	Yes	50	150	20	..	..	..	6	4	10	10
Indianapolis	..	..	35	3	..	..	..	..	..	..	..	..	22, 24, 27	..	√	..	Slow	60	60	..	..	..	..	25	6	18	18
La Porte	2	2	1	1	..	..	..	..	..	..	..	..	125,000	10	√	..	Slow	10	25	3	6	4	4	4	3	5	5
Marion	9	4	..	..	..	..	..	..	..	..	..	..	22, 24, 26	30	√	..	Slow	15	40*	10	4	12	7	7	7	15	15
Richmond	75	25	..	..	..	..	..	..	..	..	..	..	22 to 28	150	..	√	No	25	100	50	5	..	25	10	4	10	10
South Bend	2	..	8	..	..	..	..	..	..	..	..	..	22, 24, 27	5	..	√	Yes	40	30	..	..	..	3	5	1	4	4

AMERICAN ARTISAN'S SURVEY OF HEATING NEEDS*

City and State	Richmond	75	25	..	..	..	..	..	..	..	..	..	..	22 to 28	150	..	√	No	25	100	30	..	..	..	3	5	1	4	4
	South Bend	2	..	8	..	..	..	..	..	..	..	..	..	22, 24, 27	5	..	√	Yes	40	30	..	..	..	3	5	1	4	4

AMERICAN ARTISAN'S SURVEY OF HEATING NEEDS*

*Each entry represents a report from one individual contractor and does not indicate the total need of the city shown.

City and State	Furnaces Needed for Necessary Replacements—Aug. 1 to Dec. 31, 1943: Coal, Cast Iron, Gravity	Coal, Cast Iron, Forced Air	Coal Steel, Gravity	Coal Steel, Forced Air	Oil, Cast Iron, Gravity	Oil, Cast Iron, Forced Air	Oil, Steel, Gravity	Oil, Steel, Forced Air	Gas, Cast Iron, Gravity	Gas, Cast Iron, Forced Air	Gas, Steel, Gravity	Gas, Steel, Forced Air	Sizes Required, Inches or Btu	Where Must You Get Furnaces? Days Required for Delivery	Regular M'fr	Other M'fr	Can Your M'fr Supply Castings	REPAIR PARTS (Number of Parts Needed Aug. 1 to Dec. 31): Firepots	Grate Bars	Grate Rings	Radiators	Doors	Door Frames	Combustion Chambers	MANPOWER: Men Working Now	Normal Working Force	Men Could Work
IOWA																												
Burlington	..	..	30	..	..	..	..	..	..	..	..	..	22, 24, 27	..	..	√	No	9	25	6	..	4	2	6	2	6	..
Cedar Rapids	35	4	..	..	..	..	..	1	..	..	..	..	18 to 27	60	√	..	Yes	60	100	..	..	..	12	25	4	7	7
Clear Lake	20	..	..	..	..	..	..	..	..	..	..	..	22, 24	10	√	..	Yes	15	30	..	..	1	..	3	1	2	2
Cresco	3	..	2	1	..	..	..	..	..	..	..	..	80,000	30	..	√	No	4	25	..	5	..	6	3	2	3	2
Davenport	20	10	..	..	..	..	..	..	..	..	..	..	24, 27, 30	2	√	..	Yes	6	12	..	1	2	3	2	4	8	10
Dubuque	13	2	..	..	..	..	..	..	..	..	..	..	22, 24, 26	..	√	..	Yes	6	12	12	..	..	..	2	1	3	3
Ft. Dodge	40	..	..	..	..	..	..	..	..	..	10	..	24, 27	4	√	..	Slow	20	60	..	3	10	10	10	4	10	10
Mason City	..	..	10	..	..	..	..	..	..	..	..	..	22, 24	10	√	..	Yes	10	50	5	..	5	5	5	4	10	4
Ottumwa	8	..	2	..	..	..	..	..	..	..	..	..	22, 24	10	√	..	Yes	35	35	10	..	2	..	4	1	7	10
Sioux City	35	..	..	..	..	..	..	..	..	..	..	..	20 to 26	..	..	√	Yes	50	200	20	..	..	..	10	10	6	15
Waterloo	12	..	6	..	..	..	2	..	..	..	..	..	22, 24	14	√	√	Yes	30	50	..	..	..	..	5	1	4	2
Waterloo	5	..	10	..	..	..	..	..	..	..	..	..	24, 27	15	..	√	Yes	4	20	4	3	6	..	..	2	4	3
Waterloo	15	..	20	5	..	..	..	10	..	..	..	..	20 to 33	90	√	√	Yes	10	20	5	10	2	2	10	7	15	15
MICHIGAN																												
Ann Arbor	3	..	..	..	..	..	..	..	..	..	..	..	22, 24	10	..	√	....	15	24	..	..	2	2	8	..	4	4
Dearborn	20	5	5	10	1	2	1	2	1	1	1	1	100,000	20	..	√	No	100*	100*	25	15	15	15	30	10	17	100
Flint	20	5	..	..	..	..	..	..	..	..	..	..	20 to 26	8	√	..	Yes	85	200	10	2	5	5	40	..	6	10
Flint	20	..	..	..	..	..	..	..	..	..	..	..	22	7	..	√	Yes	40	100	20	..	4	8	12	1	6	10
Midland	4	..	4	..	..	..	..	..	1	..	1	..	120,000	180	√	..	Black	30	100	20	..	5	5	..	6	10	10
Pontiac	100	..	..	..	..	..	..	..	..	..	..	..	22, 26	10	√	√	Yes	125	140	40	10	5	5	10	16	28	26
Pontiac	25	5	..	..	..	..	..	..	..	..	..	..	20 to 28	10	√	..	Yes	50	100	20	5	5	10	30	5	5	7
Saginaw	25	..	20	5	..	..	..	..	..	..	..	..	24	90	√	..	No	40	200	20	..	..	..	10	7	9	7
Saginaw	50	..	..	..	..	..	..	..	..	..	..	..	20 to 26	9	√	..	Yes	50	50	10	..	5	5	20	3	6	10
MINNESOTA																												
Minneapolis	..	..	50	..	..	..	50	..	..	..	50	..	22 to 30	25	..	√	No	260	185	100	3	12	100	6	21	48	40
MISSOURI																												
Joplin	5	..	10	..	..	..	..	..	..	..	..	..	22 to 29	21	..	√	Yes	20	50	2	1	..	..	4	4	7	7
Kansas City	75	15	..	..	..	..	..	..	..	..	..	..	100,000	3	√	..	Yes	150	350	35	15	10	10	75	9	10	18
Kansas City	30	..	..	..	..	..	..	..	..	..	..	..	21 to 27	1	..	√	No	200	300	20	..	10	10	30	5	8	10
St. Louis	135	..	..	..	..	..	..	..	..	..	..	..	22, 24	30	√	√	No	200	100	10	..	6	6	25	4	12	12
St. Louis	2	..	2	..	..	..	..	..	..	..	..	..	22	..	√	..	Yes	12	24	..	2	..	..	7	1	2	2
MONTANA																												
Billings	..	..	..	..	..	..	..	..	..	..	24	12	85,000	90	..	√	No	12	48	24	2	5	..	12	7	18	25
NEBRASKA																												
Grand Island	6	..	..	..	..	..	..	..	..	..	..	..	24	Prompt	√	..	Yes	25	50	10	5	..	..	10	7	7	10
Omaha	12	..	..	..	..	..	..	..	..	..	..	..	22 to 26	21	√	√	Yes	35	100	10	..	6	6	4	2	6	6
Omaha	10	..	5	..	..	..	..	..	..	..	..	..	24	1	√	..	....	200	300	25	10	6	..	20	5	10	10
Omaha	14	1	..	..	..	..	..	..	..	..	..	..	22 to 26	1	√	..	Yes	200	700	100	40	20	15	150	3	9	5
NEVADA																												
Reno	25	..	..	..	25	..	..	..	..	..	..	..	19 to 21	75	√	..	Yes	..	..	..	..	..	..	..	3	6	6

AMERICAN ARTISAN'S SURVEY OF HEATING NEEDS*

*Each entry represents a report from one individual contractor and does not indicate the total need of the city shown.

Furnaces Needed for Necessary Replacements—Aug. 1 to Dec. 31, 1943

City and State	Coal, Cast Iron: Gravity	Coal, Cast Iron: Forced Air	Coal Steel: Gravity	Coal Steel: Forced Air	Oil, Cast Iron: Gravity	Oil, Cast Iron: Forced Air	Oil, Steel: Gravity	Oil, Steel: Forced Air	Gas, Cast Iron: Gravity	Gas, Cast Iron: Forced Air	Gas, Steel: Gravity	Gas, Steel: Forced Air	Sizes Required, Inches or Btu	Days Required for Delivery	Where Must You Get Furnaces? Regular M'f'r	Where Must You Get Furnaces? Other M'f'r	Can Your M'f'r Supply Casings	REPAIR PARTS (Number of Parts Needed Aug. 1 to Dec. 31): Firepots	Grate Bars	Grate Rings	Radiators	Doors	Door Frames	Combustion Chambers	MANPOWER: Men Working Now	Normal Working Force	Men Could Work
NEW YORK																											
Auburn	20	5	..	..	..	..	..	..	..	..	..	..	22 to 26	14	..	√	Yes	15	20	5	10	12	35	6	4	18	10
Buffalo	280	22	..	..	..	..	..	..	..	..	..	..	20, 22	60	√	..	Yes	..	..	..	..	..	..	..	18	28	28
Buffalo	..	..	45	25	..	..	..	..	..	..	15	15	100,000	60	√	√	Yes	40	80	7	..	..	..	..	3	19	6
Elmira	15	..	..	..	..	..	..	..	..	..	..	..	22 to 27	18	√	√	Yes	20	40	..	..	..	..	..	3	4	..
Rochester	75	..	..	..	..	..	..	..	..	..	..	..	22 to 28	3	√	..	Yes	..	..	..	..	..	..	..	4	10	..
Rochester	22	3	..	..	..	..	..	..	..	..	..	..	22 to 28	3	√	√	Yes	20	50	..	..	3	6	5	5	7	7
Utica	18	..	1	..	1	..	..	..	..	..	..	..	22 to 26	10	√	..	No	30	100	20	30	40	50	15	7	30	40
OHIO																											
Akron	25	..	..	..	..	..	..	..	..	..	..	..	20 to 24	15	..	√	Yes	50	50	30	..	..	..	10	2	10	12
Akron	6	..	..	..	..	..	..	..	..	..	..	..	22 to 26	30	√	..	No	30	80	30	3	1	2	15	2	7	6
Akron	25	..	10	..	..	..	..	..	..	..	..	..	20 to 24	13	√	..	Yes	30	40	20	5	10	10	30	2	8	2
Canton	..	..	50	15	..	..	..	5	..	..	..	5	22 to 27	90	√	√	Yes	100	150	20	10	10	2	10	3	11	19
Cleveland	10	..	..	..	..	..	..	..	..	..	..	..	20, 22	1	√	..	Yes	24	12*	..	..	4	4	..	4	6	12
Columbus	125	..	..	..	..	..	..	..	..	..	..	..	20 to 27	40	√	..	No	250	500	100	5	..	..	100	6	40	20
Columbus	125	..	..	..	..	..	..	..	..	..	..	..	20 to 24	90	√	..	Yes	100*	300	50	4	25	50	50	12	40	20
Columbus	100	..	200	..	..	..	..	..	..	..	..	..	20 to 24	60	√	..	Yes	300	1,000	50	10	50	50	100	15	40	30
Columbus	50	..	..	..	..	..	..	..	..	..	..	..	20 to 24	10	..	√	Yes	300	200	20	..	..	..	100	3	6	5
Columbus	175	..	..	..	..	..	..	..	..	..	..	..	20 to 28	50	√	√	No	100	200	50	30	..	..	50	12	31	18
Dayton	20	..	..	..	..	..	..	..	2	..	8	..	120,000	30	√	..	Yes	100	300	20	2	20	50	10	2	8	8
Dayton	20	..	10	..	..	..	..	..	..	..	..	..	22 to 30	..	..	√	Yes	50	60	6	..	3	3	24	3	8	..
Hamilton	45	..	..	..	..	..	..	..	..	..	..	..	20 to 24	15	√	..	Yes	120	50	75	50	..	..	45	2	4	2
Lakewood	88	..	..	..	..	..	..	..	..	..	..	..	20 to 24	1	√	..	Yes	300	400	50	30	25	25	50	6	12	12
Mansfield	50	..	..	..	..	..	..	..	..	..	..	..	22 to 28	10	√	..	Yes	75	25	5	5	5	5	15	2	10	12
Piqua	4	..	..	..	..	..	..	..	..	..	..	..	24	12	√	..	Yes	6	3	1	..	..	..	..	6	10	7
Springfield	8	..	7	..	..	..	..	..	..	..	..	..	22 to 26	14	√	..	Yes	20	100	20	..	..	..	15	4	7	10
Toledo	65	5	65	..	..	..	..	..	..	..	..	..	22 to 30	..	..	√	Yes	400	750	20	..	10	10	75	12	50	30
Van Wert	..	..	..	..	..	..	..	..	..	..	..	..	.....	..	√	..	Yes	..	..	..	..	..	..	..	..	6	6
PENNSYLVANIA																											
Beaver Falls	15	..	15	..	..	..	..	..	..	..	..	..	24 to 28	20	..	√	Yes	30	50	..	..	..	10	15	3	5	2
Erie	30	..	..	..	..	..	..	..	..	..	..	..	20 to 26	24	√	√	Yes	200	350	40	5	10	20	20	12	25	25
Pittsburgh	50	..	..	..	..	..	..	..	..	..	..	..	18 to 28	18	√	..	Yes	60	20	10	5	..	..	20	6	12	8
Pittsburgh	35	..	5	..	..	..	..	..	..	..	..	..	20 to 30	35	√	√	Yes	150	250	10	25	20	5	3	45	58	78
UTAH																											
Salt Lake City	30	20	30	20	5	5	..	..	5	5	10	20	74,000	60	..	√	No	200	300	300	150	..	..	50	7	16	16
Salt Lake City	25	10	..	..	..	..	..	..	..	..	10	5	60,000	60	√	..	Yes	100	100	100	..	..	..	..	4	24	24
WISCONSIN																											
Beloit	25	..	..	..	..	..	..	..	..	..	..	..	22 to 26	30	√	..	Yes	20	40	..	..	..	..	5	3	4	6
Jackson	5	5	10	5	..	..	..	..	..	..	..	..	22, 24	..	..	..	Yes	25	36	..	6	6	3	..	2	18	6
Total	3,202	219	794	117	41	9	54	32	11	6	132	59						6,862	11,938	2,057	616	623	853	1,917			

The Furnace Situation

EFFECTIVE July 28, furnace order L-22 A was revoked. L-22 A was the order which, on January 1, 1943, stopped the manufacture, fabrication and assembly of steel furnaces, except on orders for the armed forces. The revocation of L-22 A means that beginning July 28 steel furnaces may again be manufactured. The only limitation on the number to be produced will be the amount of steel the manufacturers may obtain.

Also effective July 28, a new order L-22 was released. The full text of L-22 is published in this issue. L-22, as now in force, will control the production of *both* cast iron and steel furnaces. Most of L-22 is self explanatory, but some interpretations have already been given by WPB as follows:

1—Under Section (b) (i) "materials in inventory" means all material—no matter how the manufacturer obtained these materials, or when. Manufacturers can, therefore, use materials in idle or excess inventory even if reported to Iron and Steel Branch of WPB.

2—Under Section (b) (4) "types produced"—the intent is to prevent switching from one type of fuel to another or from one material to another and to enforce conservation by approving all new models of furnaces proposed.

3—Under Section (d) (1) "simplification" the intent is to eliminate all "A," "B," "C" grades of furnaces by any one producer and, if possible, get manufacturers to use their materials to produce the greatest number of furnaces per ton of material. To eliminate all "De Luxe" models, in other words.

Number of Furnaces

According to the interpretation of the order there will, hereafter, be no limitations on the number of furnaces (either cast iron or steel) which a manufacturer may produce. Previous L-22 permitted the manufacture of 50 per cent of the furnaces produced in 1940 by each manufacture of 8,000 furnaces or more and 90 per cent of the furnaces produced in 1940 by each manufacturer of fewer than 8,000 furnaces.

Under the new L-22 each manufacturer may make as many furnaces as he can get material for, but material will continue to be assigned to each manufacturer under Controlled Materials Plan. Under CMP each manufacturer is allocated a certain amount of material in each calendar quarter.

This month our manufacturers are operating on materials allocated for the third quarter. The requests were made before L-22 was revised so it is permissible for each manufacturer to submit a supplementary request for materials from which to make furnaces. The assumption is, of course, that no manufacturer will ask for more materials than he can convert into furnaces. Whether these supplementary applications can be granted in full remains to be determined.

Applications for material to be used in the fourth quarter are now being filed by manufacturers. The amount of material the industry will be given for furnaces for the fourth quarter will be known about September 15.

How Many Furnaces Are Needed?

Before the industry can intelligently request materials for furnaces two things must be known. First, how many furnaces are needed. Second, can we produce the furnaces.

On question one, Procurement Division of WPB has announced that for essential war housing it is estimated we must let to contract between July 1 and December 31, 1943, the following:

121,000 privately financed housing units. 100,000 of these will be new construction. 21,000 will be conversions.

315,000 publicly financed housing units. Of these only units like dormitories will use furnaces, or probably 70,000 units to be heated from furnaces. This is not 70,000 furnaces because the usual dormitory heats about 100 units from one furnace.

Following is the Procurement Division's calculation of the furnaces needed from July 1 to December 31 to satisfy this housing program.

Coal, gravity (60,000 Btu or less)	24,950
Coal, gravity (60,000 to 100,000 Btu)	5,980
	30,930
Oil, gravity (60,000 Btu or less)	863
Oil, gravity (60,000 to 100,000 Btu)	100
	963
Forced Air, coal (60,000 Btu or less)	5,650
Forced Air, coal (60,000 to 100,000 Btu)	2,270
Forced Air, coal (100,000 to 350,000 Btu)	800
Forced Air, coal (350,000 to 600,000 Btu)	1,507
Forced Air, coal (600,000 or more)	251
	10,478
Forced Air, gas (60,000 Btu or less)	260
Forced Air, gas (60,000 to 100,000 Btu)	0
Forced Air, gas (100,000 to 350,000 Btu)	147
Forced Air, gas (350,000 to 600,000 Btu)	113
Forced Air, gas (600,000 Btu and over)	16
	536
Forced Air, oil (60,000 Btu or less)	1,128
Forced Air, oil (60,000 to 100,000 Btu)	37
Forced Air, oil (100,000 to 350,000 Btu)	1,146
Forced Air, oil (350,000 to 600,000 Btu)	700
Forced Air, oil (600,000 Btu and over)	17
	3,028
Forced Air, coal (Chimney Furnaces)	4,100
Coal-fired, chimney furnace-range	1,300
	5,400

Required AA-3, 60,000 Btu Units

The tabulation above discloses that this industry must produce for essential war housing a total of 32,851 furnaces burning coal, oil, gas in sizes rated 60,000 Btu or under. The industry normally specifies this size of furnace as the 18 or 20-inch gravity furnace, coal burning.

At a meeting of furnace manufacturers, August 3, manufacturers present were asked to report on the number of furnaces under 60,000 Btu they can produce from August 1 to December 31. The report showed—3,855 cast iron furnaces; 20,730 steel furnaces; total 24,585 furnaces.

This reported maximum possible production is fewer furnaces than the number required for essential war housing. To produce these 24,585 furnaces, every possible production source will be needed and steel furnace manufacturers must be permitted to produce and must be given materials to produce to

their maximum capacity. We have no guarantee that steel will be allocated, but surely in allocating steel WPB must recognize this need for furnaces for war housing. If the National Housing Agency will also add its appeal for steel, it seems reasonable that every manufacturer in the industry can plan to produce his maximum number of AA-3 rated, 60,000 Btu or under furnaces—both steel and cast.

Can We Produce Them?

With more small furnaces needed for essential war housing than furnace manufacturers report they can produce at the moment, the question is—"can we meet these requirements?"

Also, "if the industry cannot produce by voluntary methods the 60,000 Btu furnaces required, what greater production can the Washington agencies obtain by additional industry control?" This publication can see only one means whereby more than 24,585 60,000 Btu furnaces can be obtained. This method is by allocation of materials and by directives to compel manufacturers to concentrate on 18 and 20-inch furnaces and stop making any furnaces larger than 60,000 Btu.

But this assumes that every furnace manufacturer has the patterns for these small furnaces. However, some manufacturers never did make 18 and 20-inch furnaces and can they do so now in time to do any good is a question. "Do these manufacturers want to make small furnaces" can no doubt be answered by saying—"Yes, we will do our part to help in the war effort."

That there is additional production capacity beyond the 24,585 18 and 20-inch furnaces reported above is indicated by the report of the manufacturers at the meeting showing that the industry can produce between August 1 and December 31 50,550 cast iron furnaces of all sizes and types plus 47,250 steel furnaces of all sizes and types—if the materials are made available.

These figures show that the industry's potential production from August 1 to December 31 is 97,800 furnaces of all sizes and types against a required 32,261 small furnaces needed for essential war housing.

By this reasoning, then, if manufacturers are restricted to small furnaces only, the needs of war housing can be met.

Unfilled AA-3 Orders

There is another important factor, however, disclosed by the manufacturers' reports. This concerns orders on hand for 60,000 Btu, AA-3 rated furnaces, ordered by contractors for housing units let to contract during January 1 to July 1, 1943, but furnaces not yet delivered and presumably not yet manufactured.

The total number of such 60,000 Btu furnaces on order is 22,195. This means that this total of 22,195 furnaces on order, but not delivered or produced, must be added to the 24,585 60,000 Btu furnaces yet to be ordered this year to make a total of 46,780 required to meet essential war housing in 1943.

This total of 46,780 60,000 Btu furnaces must be deducted from the potential production of 97,800 furnaces to find the number of furnaces possible of production in sizes larger than 20-inch. There can be then about 51,000 furnaces larger than 20-inch available this year.

But, as indicated in the tabulation of housing needs, there are larger furnaces than 20-inch needed for the essential housing program. The tabulation shows 13,084 furnaces of sizes from 60,000 Btu to over 600,000 Btu required for dormitories and similar war housing.

Additional Production

By the calculations presented above we arrive at a figure of 38,000 furnaces to be made during the remainder of 1943 not earmarked and in sizes suitable for replacement.

So that these figures cannot be misinterpreted it should be emphasized again that the figures do not represent *all* the industry's production. How much additional production is available, this publication does not know, but various estimates say the figures represent 80 to 90 per cent of the total industry production.

It does not seem as though the possible production of 60,000 Btu furnaces will be effected because these figures cover practically every manufacturer who ever has or can make these small furnaces. But there may be an additional 10 or 20 per cent capacity available to make the larger furnaces used in replacement. Only a complete report can tell—probably only actual production figures at the end of the year will disclose how many more furnaces can be produced.

Manpower Problems

Almost without exception, manufacturers report their foundries and plants operating on reduced manpower. This industry has not been able to hold workmen in the face of higher wages paid in war plants. No tabulation has been made of how many foundrymen and fabricators the manufacturers need, but undoubtedly the number is legion.

Up to now few manufacturers have obtained any relief from War Manpower Commission. Applications and appeals have been made. Manning tables have been filed. Certificates of availability have been denied, but still manpower has been drained away. The only relief this industry can hope to get must come from the Office of Civilian Requirements if OCR will assume responsibility to act for the industry.

High Priority Orders

A year ago, and again last December when L-22 and L-22A was being written, many of the cast iron furnace foundries and the steel furnace fabricators sought war orders to keep their establishments working. Such orders were obtained. The situation, now, is that many foundries are filled to capacity or nearly so with AAA and AA-1 contracts and sub-contracts.

There is no way, that we know of, under which a manufacturer can reject or stop production of these high priority war contracts in order to devote facilities to production of furnaces on AA-3 or A-10 orders.

And many manufacturers, having begged for these orders when they needed them would not now, if they could, stop this production.

It is with a complete realization of these manpower and high priority order problems that manufacturers' reports of potential production shows so few furnaces possible in the remainder of 1943.

The Replacement Problem

The picture does not look encouraging for furnaces needed in replacement. Just what is needed has been subject to much conjecture and many "guesstimates." If OCR is to claim materials and manpower for furnaces needed for war housing and replacement—definite figures of needs are required.

To supply a basis for such needs, AMERICAN ARTISAN had prepared a replacement needs survey. It is published in this issue.

L-22 - The New Furnace Order

PART 1021—FURNACES

[General Limitation Order L-22 as Amended July 28, 1943]

Section 1021.1 *(General Limitation Order L-22)* is hereby amended to read as follows:

§1021.1 *General Limitation Order L-22*—(a) *Definitions.* For the purposes of this order:

(1) "Furnace" means any direct fired air heating unit which is designed for the purpose of heating the interior of a building, including but not limited to, any heating device commonly known as a gravity or forced warm air furnace, a free-standing heater or a floor-mounted unit heater for use with or without air distribution pipes. But "furnace" does not mean a domestic heating stove as defined in Supplementary General Limitation Order L-23-c, extended surface heating equipment as defined in General Limitation Order L-107, a direct-fired suspended unit heater, or a floor or wall furnace.

(2) "Steel furnace" means any furnace the heating surface of which is wholly or partially made of steel.

(3) "Cast iron furnace" means any furnace the heating surface of which is made of cast iron.

(4) "Base period" means the three year period ending April 11, 1942.

(b) *Restrictions on manufacture.* (1) No person shall manufacture, fabricate or assemble any steel furnace except:

(i) From materials in inventory on July 28, 1943, or as authorized from time to time by the War Production Board under the Controlled Materials Plan or otherwise.

(2) On and after September 26, 1943, no person shall manufacture, fabricate or assemble any steel furnace designed to burn solid fuel except in accordance with the simplified practices as provided in paragraph (d).

(3) On and after September 26, 1943, no person shall manufacture, fabricate or assemble any cast-iron furnace designed to burn solid fuel except in accordance with the simplified practices as provided in paragraph (d).

(4) Any person desiring to produce furnaces and not having a production record of solid, liquid or gaseous fuel burning furnaces made of cast-iron or steel during the base period, shall submit the specifications of any such furnaces to the War Production Board before beginning the manufacture of any such furnaces. The War Production Board may then authorize the production of such furnaces.

(c) *Furnaces to be delivered only on rated orders.* On and after August 1, 1943, no person shall deliver any furnace except on an order rated A-10 or higher.

(d) *Simplified practices.* On and after September 26, 1943, no person shall manufacture, fabricate or assemble any furnace designed to burn solid fuel except in accordance with the following practices:

(1) Only one model each of cast iron and steel furnaces of the same nominal firepot diameter or the same grate area shall be manufactured.

(2) The metal casing supplied with a furnace rated between 50,000 and 250,000 BTU shall be cylindrical when used on gravity installations.

(3) Cylindrical casings used on furnaces of less than 250,000 BTU shall not be heavier than 26 gauge.

(4) The following parts shall not be made of metal:

(i) Feed door smoke curtains.

(ii) Feed door linings.

(iii) Hot blast lift doors.

(iv) Water pans.

(v) Humidifiers.

(vi) Coiled wire handles or "detachable type" handles.

(vii) Extra panels for turning radiators (unless specifically ordered for an individual installation).

(viii) More than one detachable name plate.

(ix) Inner liner for casing.

(x) Upright shaker handle, except cast iron.

(e) *Restriction on shipment of accessories.* On and after September 26, 1943, no person shall ship any of the following accessories with any furnace other than a furnace delivered to or for the account of the Army, Navy, War Shipping Administration or the Maritime Commission of the United States, or for use in any building or project authorized under order P-55-b or rated under any order in the P-55 series or any order in the P-19 series.

(i) Iron or steel poker.

(ii) Metal check damper.

(iii) Metal hand control draft regulator, chain and pulleys.

(f) *Parts.* Nothing in this order shall prohibit or restrict the manufacture or shipment of repair parts for furnaces or parts necessary to convert a furnace from oil or gas burning to coal burning.

(g) *Applicability of other orders.* Insofar as any other order issued by the War Production Board, or to be issued by it hereafter, limits the use of any material to a greater extent than the limitations imposed by this order, the restrictions of such order shall govern unless otherwise specified therein.

(h) *Appeals.* Any appeal from the provisions of this order shall be filed on Form WPB-1477 (formerly PD-500) with the Field Office of the War Production Board for the district in which is located the plant or branch of the appellant to which the appeal relates.

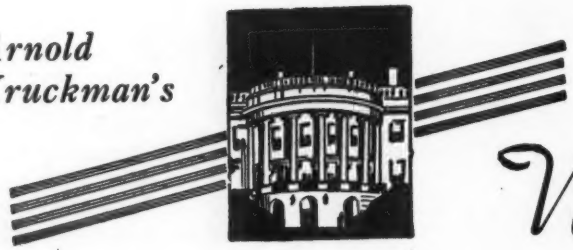
(i) *Communications.* All communications concerning this order, unless otherwise directed, should be addressed to the War Production Board, Plumbing and Heating Division, Washington 25, D. C., Ref.: L-22.

(j) *Violations.* Any person who wilfully violates any provision of this order, or who, in connection with this order, wilfully conceals a material fact or furnishes false information to any department or agency of the United States is guilty of a crime and upon conviction may be punished by fine or imprisonment. In addition, any such person may be prohibited from making or obtaining further deliveries of, or from processing or using, material under priority control and may be deprived of priorities assistance.

Issued this 28th day of July, 1943.

WAR PRODUCTION BOARD,
By J. JOSEPH WHELAN,
Recording Secretary.

Arnold Kruckman's



Washington Letter

Our "Bedrock" Economy

THE picture of the country's much talked about "bedrock economy" is now emerging more sharply. It will come to full development about New Year. Most new things *as* new things will gradually disappear from shelves and warehouses, and practically no new things will be produced for the civilian economy. Actual production will be restricted to parts for maintenance and repairs. Baldly and nakedly that is the impression we get here.

Naturally you will find few persons in responsible official places who will outline it with quite the brutal frankness employed here. But they permit you to gather this impression off the record. Anything made of metal obviously comes high on the list of things which will dwindle. Bed rock in metal sheets, machines, tools, mechanical apparatus, electrical gadgets, and the numerous things used on equipment installed by your industry means they may be had for housing and structures in critical labor areas and for war purposes, and will be available for repairs and maintenance in other areas, but may not be manufactured for any other purposes.

You have a striking illustration in the long-awaited furnace order L-22 recently promulgated by Plumbing and Heating Division of WPB. It practically places no restriction on the manufacture of furnaces by those who made furnaces during the three years ending April, 1942, *if you can get materials.* It does, however, make easier the production of parts. And, incidentally, if you read it carefully you will notice that industrial unit heaters are *not* authorized by L-22. Some special permission must be negotiated by those who make them.

Materials and Manpower

The problem patently is where to get materials and how to get manpower. Both are constantly dwindling. Much of the optimistic misunderstanding about materials and manpower has stemmed from the orders which apparently have permitted production of many things. There was, for instance, the farm equipment order which we were told would be realized by an allocation of 1,000,000 tons carbon steel. The wholesalers and the dealers have never been very much excited by the announcements. They tell you they have yet seen only a tiny part of the 1,000,000 tons of steel. Their attitude seems to be that they will believe there may be a 1,000,000 tons of steel to make the things the farmers demand when they actually know the steel is rolling into the factories.

WPB itself seems to be in a quandry about that steel. You will notice it launched a Share-the-Steel campaign, especially directed at those who may have surplus inventories in their third and fourth quarter allocations. They ask them not to requisition more steel until they have used the steel they still have on inventory. Apparently the idea is to use steel thus pried loose to enable factories of farm equipment and other things to produce that which is desperately in demand by the civilian economy.

You naturally have heard that approximately 6,000 contractors have received cancellations from the Armed Services the past six months. And this has logically led to the question about the utilization of methods and other critical raw materials released by the cancellations. The usual answer is that most of it has been shifted to the production of other things for war needs. The war has been stepped up both in Europe and in the Pacific. It is simple A-B-C to realize that as the war expands more products will be consumed. That is where those highly debated stockpiles come in.

Stockpile Arithmetic

The Armed Services properly feel stockpiles must be kept at the ultimate quota level, and that new stockpiles must be created wherever the fighting men are active. Naturally, and logically, the Armed Forces feel it is smarter to waste materials in stockpiles than to waste the lives of soldiers and sailors. By the same reasoning it appears logical that there is less waste in winning the war by providing great quantities of commodities and materials for distribution by Lend-Lease and BEW and other agencies than by wasting soldier lives. It is true the burden falls more heavily on the civilian, industrialist or consumer, but in the large the hardships not only are spread far more widely, but the very spreading thins out the hardships to an attenuation that brings less suffering to all those participating in the war. This is Total War, American version.

You see, of course, naturally and logically the Armed Services by inevitable force of circumstances dominate the sequence of events you feel in the shrinkage that is expected to come to a climax by New Year. It is unfair to assume the Armed Forces do not understand the principles as well as the practice of industrial and commercial economy. Most people, it is curious to find, seem to have forgotten the Army Industrial College. This institution came into existence approximately fifteen or sixteen years ago. Its students were chosen from all parts of the Army, the Navy, and the Marine Corps. Here in Washington some of the best men from schools like the Harvard School of Commerce lectured to the students; and the heads of the greatest industrial corporations of America came here to lecture. There is scarcely a technologist or a specialist in any branch

of any major industry who has not taught these officers.

And when they had sufficiently assimilated the facts and theories of business and industry in the classrooms, the soldiers and sailors were sent out to Pittsburgh, to Chicago, to Cleveland, to Wheeling, to all the great centers of industry as well as to mines and to ports and transportation nerve centers. Here, in the steel plants, in the glass plants, in packing houses, in textile factories, in mines, in the offices of railroads and in the port centers, in all great industrial institutions and in financial institutions, by practical experience, they learned all phases of the administration and operation of industry. Since the great circus is regarded as the operator of the best mobile commissary, Gen. Pelham Glassford spent a part of a year traveling with a circus. Later he spent some months on the staff of a newspaper. Thousands of officers, then young men, now matured, were indoctrinated in the ways and thoughts of business. Most of them now probably are in positions of decisive influence, and are able to meet the problems of business and industry on their own terms. Before this war, Congress provided many millions to enable the Armed Services to test their knowledge in the handling of *educational orders.*

Leather, Essential Oils

When you realize this background you may understand why we feel here there is intelligence in the handling of various puzzling activities in WPB, BEW, and elsewhere. Unquestionably the people of the Armed Forces think there would be far less uproar if the consumer, the taxpayer, could grasp the idea that he is much in the same position as the patient whom the physician must hurt before he can make him feel better. For instance, there is the shoe repairman and the wholesaler who supplies him. His chief stock in trade is leather. Troops use vast quantities of leather for shoes. They require vast stockpiles of shoes and leather. Shoes and leather for shoes, seem to be scarce everywhere. Recently Lend-Lease sent great quantities of shoes and leather to Russia, to England, North Africa, and apparently is preparing to send them to Italy. It is reported 23,000,000 pairs shoes were purchased from the stocks of American shoe stores for shipment to distressed countries.

Meanwhile we have not imported many hides from South America, our normal source of foreign supply; and there has been so little slaughter of cattle that the supply of leather has been scant. The wholesaler has had increasing difficulty in obtaining leather, and sees no relief until next year. The repair shops have closed in various places, and are expected to close by thousands during the next four or five months. In this case the consumer suffers directly by lack of facilities to repair his shoes. He has the same trouble in this instance as he has with the laundries. He has infinitely more business to offer them, and is willing to pay more for the service, but the laundries are rapidly closing everywhere for lack of fuel to run their machinery, and permission to run their trucks, and, chiefly, lack of manpower—in this case womanpower.

The cosmetic, flavoring and toiletries industries are shrinking for lack of industrial alcohol, used for war; and for lack of essential oils such as peppermint oil, used for food flavors, more than one-fourth of which this year is to be sent to England, and another fourth is to be used to make menthol (which normally comes from Dutch East Indies), leaving us with less than 400,000 pounds for food while we normally use 2,500,000 pounds annually.

Food

Food production critically affected by lack of manpower, machinery, and abnormal demands of distribution, will be so short in the next five months, according to Chester Davis, that, in the published opinion of Davis, some parts of the United States will not have enough in caloric value to sustain health according to the international standards. Newspapers, periodicals, books, are visibly shrinking because pulp production has been restricted, to use its components for war, and because the manpower used in making paper and producing publications is rapidly being siphoned off to war purposes. Thousands of printers' shops are expected to close. Restaurants will vanish by thousands the next few months because many of them will be unable to give service. Restrictions will compel them to abandon some tableware, linens, various types of service, and they must do with much less manpower.

It is possible to go on for many pages with a list of things and services that will inevitably disappear. The actual list of critical materials involved is short. But the trouble is that when the absence of a critical material prompts the use of a substitute the substitute in turn becomes scarce and in turn adversely affects corollary materials. It has only lately become entirely obvious to most of our bellwethers here that abnormal manipulation of key materials causes major dislocation of the whole economy.

Manpower Problems

Manpower is the chief trouble. Most of the draft boards have small regard for the "essentiality" classifications. It is a fact that a very indifferent and usually unnecessary technologist or scientist whose profession is identified popularly as conspicuous is apt to be classified as exempt, while the key man in a vital industry who has no scholastic glamor but is enormously important to the welfare of thousands, will be rushed into the Army or Navy. This is naturally the result of ignorance and exasperation. The pressure on most draft boards for manpower is so great that inevitably often they work by rule rather than by reason.

There is no clear public information about the ultimate number of men who will be impressed in the Armed Services. Early in July Maj.-Gen. Hershey, head of Selective Service, said there were approximately 7,000,000 men in the Services, and that another million would be added. It also was clear from the General's discussion that by New Year most of those presently deferred but qualified for service would be called, and that fathers would undoubtedly be compelled to go into the Army. Obviously this spells far greater manpower difficulties for war industries as well as civilian industries.

There have been important backstage discussions about the legislation which will enable the Government to draft men for work. It is expected the Administration will propose the necessary bill when Congress meets. Labor is reported to be sour on the subject, and the idea is reported to be unpopular throughout the country. Congress therefore is not expected to act swiftly, and to act with reservations when and if it finally acts, about New Year. Meanwhile the loquacious Mr. McNutt has tried to apply local poultices by the initiation of the "locally needed"

(*Continued on page* 80)

Interpretations, Amendments, Easements To Existing Orders

Steel Delivery

CHANGES in procedures governing sales of steel and copper by warehouses and distributors are effected by a general revision of Controlled Materials Plan Regulation No. 4.

A major change permits a distributor to refuse any order for steel, including an authorized controlled materials order, which does not call for immediate delivery.

Orders calling for immediate delivery which must be filled include authorized controlled materials orders, orders from farmers under the provisions of Priorities Regulation No. 19, and orders bearing preference ratings of AAA.

◆

Small Motor Replacement

THE sale of a fractional horsepower motor to replace one broken down is considered a maintenance and repair transaction, where the broken one is taken in by the repairer.

This transaction, according to Interpretation 3 of General Limitation Order L-123, effective July 14, 1943, issued by the War Production Board, comes within the exemption provided by Order L-123, covering the delivery of maintenance and repair parts.

◆

Hand Tools

EMPLOYES will be permitted, under specific circumstances, to use CMP Regulation No. 5 preference ratings assigned to their employers to purchase hand tools that they require to retain or obtain employment, the War Production Board announces.

At the same time, WPB is permitting employers to purchase such items as hand tools for resale to employes, although this has not been a customary business practice in the past.

If the employer is unwilling or unable to (1) buy the necessary tools for himself and check them out to his employes, or (2) purchase tools for resale to employes, an employe may use his employer's MRO preference rating to purchase tools (including gages and engineering instruments) which he requires for use exclusively in his employer's business and which his employer requires him to furnish. The rating will be valid only if the employee gives the seller of the tool a certificate filled out and signed by his employer and himself as follows:

Preference Rating—(specify rating). The following hand tool (only one tool may be placed on each certificate; specify type and size of tool) is required by the undersigned employe as a condition to retaining or obtaining employment with the undersigned employer. The undersigned employe further certifies that he does not own or possess any similar tool which will serve the same purpose.

Name and address of employer; authorized signature, signature of employe, position.

This procedure is available only to industries listed on either Schedule I or Schedule II of CMP Regulation No. 5, which assign AA-1 and AA-7 preference ratings, respectively, for WRO purposes, to the listed businesss activities.

The cost of hand tools purchased by an employe through the use of preference ratings must be included by the employer in computing expenditures for MRO for the purposes of the quantity restrictions of CMP Regulation No. 5.

◆

Special Warehouse Prices

WAREHOUSEMEN and jobbers on sales of iron and steel products when the buyer has specified special delivery service may pass on to the buyer actual special delivery service charges less than normal freight from the shipping point to destination, the Office of Price Administration announced today.

Special delivery services are defined as shipments by railway express, air express or parcel post.

If the special delivery service charge is cheaper than normal freight, however, the difference between the special delivery charge and normal freight must be deducted from the maximum delivered price for the shipment.

This change in computing transportation charges is made in Amendment No. 17 to Revised Price Schedule No. 49 (Resale of Iron and Steel Products), and becomes effective July 20, 1943.

In another pricing revision, Amendment No. 17 authorizes warehousemen and jobbers to use freight rates applicable to less-than-carload shipments in computing freight charges on mixed carload shipments of iron and steel products within their normal marketing areas.

Under the Schedule, the mixed carload price is computed by making a specifically-provided deduction from the 500-pound quantity price. Previously, when freight was one of the elements used in determining the 500-pound quantity price, the schedule required that carload freight be used for mixed carloads in every instance.

Under the Amendment, freight rates applicable to less-than-carload shipments now may be used in mixed carload shipments except for the additional freight charge permitted in sales beyond the seller's normal marketing area. The additional charge must be based upon the carload rate.

Sales beyond the normal marketing area include shipments of dislocated tonnage, shipments from one OPA zone to another, shipments between zoned and non-zoned areas, and shipments within a zone where maximum freight absorption provisions are applicable to less-than-carload shipments on mixed carload shipments within the seller's normal marketing area is in conformity with industry practice on April 16, 1941, base pricing date of the schedule, OPA said.

(*Continued on page* 72)

RESIDENTIAL AIR CONDITIONING

SECTION

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

KEEP A DRUM ON THE TRUCK!

Every owner of a CAST-IRON furnace is a prospect

Fireline repairs cracked, checked, and burned-out castings. It forms a lining around the firepot which seals all cracks and holes—makes the firepot gas tight.

On many furnace cleaning and service jobs where the castings are still in good condition, you can make an extra sale—earn an extra profit—by selling the owner a Fireline lining to protect and preserve the castings.

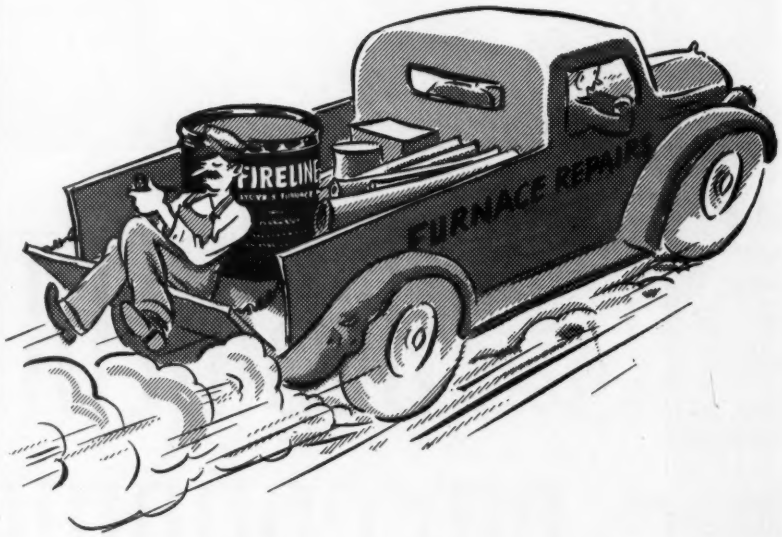
Fireline gives more heat from less fuel. Installation is easy; no dismantling of the furnace is necessary. So while you can quote a lower price, the *percentage* of *net profit* is greater on a Fireline job than on the installation of new castings. This is particularly true when you carry Fireline right on the truck.

●

ALL SHAPES AND SIZES

—for those STEEL furnaces

Yes, the special shapes for steel furnaces lined with fire brick are as different as the shapes on a public beach—and far less plentiful today. Brick like those illustrated are typical; but, in effect, you have every brick shape under the sun in a drum of Fireline. It can be readily moulded to any form, and the finished job is a durable, jointless lining of highest quality. Special shapes are easy when you have a drum on the truck.



It meets all emergencies—makes your jobs more profitable

THERE'S no escaping the fact that Fireline is the answer to the furnace man's prayer in these times when it's so hard to obtain firepot castings for cast-iron furnaces and special fire brick for steel furnaces. Fireline certainly does the job a lot faster than it can be done with replacement castings or special brick. And, above all, you can always get Fireline from your jobber *without bothering with permits or priorities.*

However, if you want to get the maximum profit out of those repair jobs, just adopt the tried suggestion that appears above: Keep a drum of Fireline right on the truck. You're then ready to quote your price and go right to work on anything that turns up. No going back to the shop or waiting for parts to be delivered. Every minute on the job counts.

Notice how Fireline fulfills all needs for cast-iron and steel furnaces as briefly covered opposite. That's why it always pays to keep a drum on the truck.

Write for free bulletin, estimating chart, prices, and name of nearest jobber.

FIRELINE
STOVE & FURNACE LINING

FIRELINE STOVE & FURNACE LINING CO.
1816 Kingsbury Street (Department H) Chicago, Illinois

Business Is Still Where It Always Was—In The Prospect's Basement

"THERE are no new ways for finding business under today's difficulties," says Floyd E. Doubleday, Jr., operator of the Doubleday Heating Company, in Kansas City, "and the old established methods of digging up prospects and making customers out of prospects are still effective if used intelligently.

"The fellow who is expecting customers because so many shops have closed or men have gone to the services is, we think, going to be disappointed.

"New business today is just where it always has been—in the prospect's basement. To get work out of that basement means just as much effort today as it ever did.

Much Repair Work Waiting

"In most cases the owner doesn't know he needs work done until something falls to pieces. There are thousands of heating plants in every community of any size in bad condition, requiring all kinds of repair work. Some of these heating plants can be put in top condition with a good, thorough cleaning; many need a new grate bar or adjustment of the controls, firing device—perhaps just a balancing of the heat supply.

"Many of these furnaces are in such condition that replacement is advisable, but the owner doesn't know what he can do legitimately and probably has no way of judging whether recommendations are fair or just high pressure sales propaganda. For this reason any firm wanting to stay in business today should try mightily to build a background of fair and honest dealing and should make every effort to give the customer a little more than was promised.

"In our own case we find that 75 per cent of all our new business comes directly or indirectly through customer recommendation, either individuals or business firms. We believe that this justifies our effort to do a little better job than the other fellow.

"When we started this business some seven years ago we decided to cater particularly to the needs of homes already built. We believed then, and we still do, that this market offers better profits and better inducements for a substantial business, good times or bad.

"We have confined ourselves exclusively to heating problems and heating service. This includes everything from cleaning a furnace or boiler to installing a new furnace, a blower, stoker, oil burner, controls, or a new winter air conditioning system with any type of heat desired. When we had mechanics and service men we consistently sent them to factory schools each year in order to maintain the technical training so essential to modern heating.

Sales Without Salesmen

"This year, as in years past, we depend on steady plugging on prospects to get work. In the spring and early summer we start a telephone solicitation of both old and new customers, offering our cleaning service. A substantial portion of this cleaning work results in repairs, replacements and improvements. And many of these orders come from a telephone call that was a cold canvass for a cleaning order.

"In the past years we conducted a house-to-house canvass, but this year with the shortage of help we can't hope to canvass as we have in the past, so we will rely on the telephone. We never have had much success from direct mail campaigns as prime business getters, but we have used direct mail to follow up prospects disclosed through canvass or telephone solicitation.

"One thing we certainly will do this year is try to impress on our prospects that our cleaning service is not a high pressure sales campaign and that for several years we have offered the same kind of a service and have hundreds of satisfied customers. To prove our offer is legitimate, we expect to cite satisfied customers in every neighborhood."

Simplified—*but better*—Gravity Systems

This is the fifth of several articles reprinted from University of Illinois, Engineering Experiment Station Bulletin No. 45. The new simplified gravity system proposes seven changes from the Standard Gravity Code —(1) leader pipe size in Btu, not sq. in.; (2) a unit piping system; (3) consideration of long leaders plus several elbows; (4) fewer pipe pieces; (5) furnace rated in Btu delivery at the register; (6) five good return systems; (7) 16, not 100, return air grille sizes.

APPENDIX D

Laboratory Tests on Horizontal Runs of Round, Square, and Rectangular Leader Pipes

1. *Object.*—The objects of these tests were (1) to compare the carrying capacity of leader pipes having a sudden rise and a long horizontal section with that of leader pipes having a uniform pitch from bonnet to boot, and (2) to compare the carrying capacities of round, square, and rectangular leader pipes having the same equivalent diameter.

2. *Description of Plant and Method of Procedure.*—These tests were run on the auxiliary single-leader furnace plant described in Engineering Experiment Station Bulletin 188, and the same method of procedure was followed.

3. *Horizontal Leader Pipes.*—The carrying capacities of the arrangement consisting of a sudden rise and a horizontal section of round leader pipe for a first-story run are shown in Curve *F*, Fig. 13. For a register air temperature of 180 deg. F., the carrying capacity was 9,000 B.t.u. per hr. If a 12-in. x 9-in. register had been used in place of the 12-in. x 10-in. register, the capacity would have been approximately 8,640 B.t.u. per hr.* Carrying capacities of leader pipes having a uniform pitch from bonnet to boot are given in Table 13. For Unit No. 3, consisting of a leader pipe 10 in. in diameter and 12 ft. in length, connected to a 12-in. x 9-in. register, the capacity is given as 8,340 B.t.u. per hr., or 3.6 per cent less than that obtained with the arrangement consisting of a sudden rise and a horizontal section of round leader pipe.

In the case of second-story runs, the capacities of the arrangement consisting of a sudden rise and a horizontal section of round leader pipe are shown in Curve *E*, Fig. 13. For a register air temperature of 170 deg. F., the capacity was 11,500 B.t.u. per hr., but if a 14-in. x 3¼-in. stack had been used in place of the 12½-in. x 5½-in. stack, the capacity would have been approximately 10,870 B.t.u. per hr.* The carrying capacities of arrangements consisting of leader pipes having uniform pitch from bonnet to boot are given in Table 14. For Unit No. 14, consisting of a leader pipe 10 in. in diameter and 12 ft. in length, connected to a 14-in. x 3¼-in. stack, the capacity is given as 10,390 B.t.u. per hr., or only 4½ per cent less than that shown in Fig. 13, Curve *E*.

The capacities for arrangements *F* and *E* shown in Fig. 13 were in fairly close agreement with the

*Univ. of Ill. Eng. Exp. Sta. Bull. 188, p. 67, Fig. 40. The carrying capacity for a 12-in. x 9-in. register connected to a 10-in. dia. leader was approximately 0.96 of that for a 12-in. x 10-in. register connected to the 10-in. dia. leader pipe.

*From Fig. 3, the relative heating effects were 0.935 and 0.99 respectively for stack-leader ratios of 0.58 and 0.88.

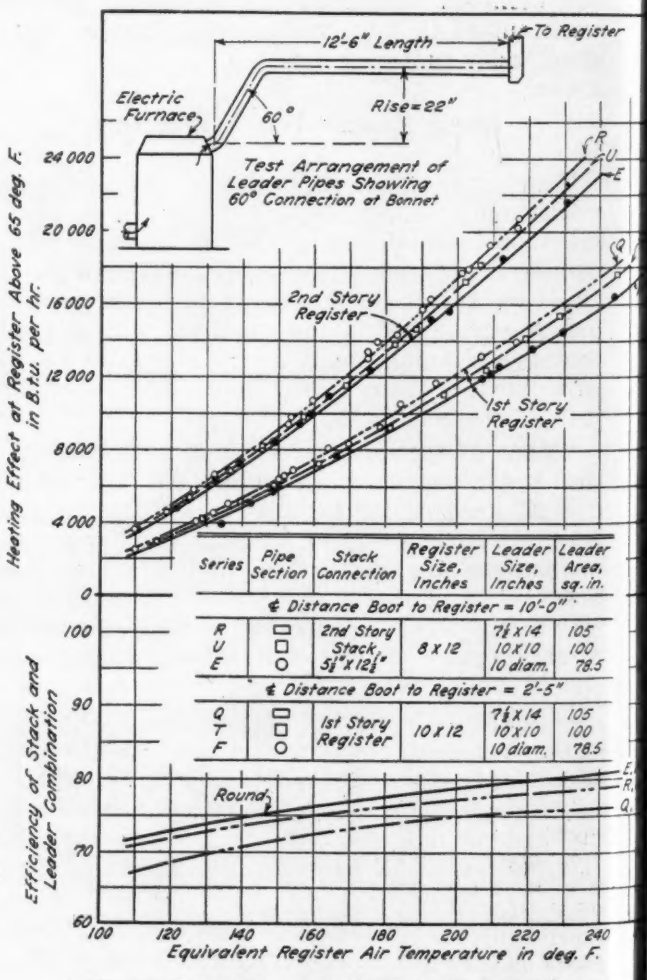


FIG. 13. CARRYING CAPACITY OF HORIZONTAL RUNS OF ROUND, SQUARE AND RECTANGULAR LEADER PIPES.

TABLE 19
CARRYING CAPACITY OF ROUND, SQUARE, AND RECTANGULAR LEADER PIPES TO SECOND-STORY REGISTERS

Leader Pipe				Ratio of Stack Area to Actual Leader Area	Relative Heating Effect*	Correction Factor†	Carrying Capacity at 170 deg. F., B.t.u. per hr.		
Shape	Dimensions	Equivalent Diameter in.	Equivalent Area sq. in.				Actual	Corrected†	Per Unit Equivalent Area
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Round	10-in. dia.	10.0	78.5	0.88	0.990	0.975	11 400	11 100	141
Square	10-in. x 10-in.	11.0	95.0	0.69	0.960	1.005	11 800	11 850	125
Rectangular	7½-in. x 14-in.	11.1	97.6	0.66	0.955	1 010	12 300	12 420	127

*From Fig. 3.
†Corrected to an equivalent delivery with stack-leader ratio of 0.7

corresponding capacities shown in Tables 13 and 14. Hence, it may be concluded that the tables are applicable to arrangements consisting of a sudden rise and a horizontal section of round leader-pipe, and that two 30-degree angles similar to those shown in the elevation in Fig. 13 need not be counted as equivalent elbows. In addition, tests made on an arrangement consisting of a round leader pipe with a vertical rise containing two 90-degree elbows followed by a horizontal section, indicated that the carrying capacity of this type of run was substantially the same as that for a run in which the leader pipe had a uniform pitch from bonnet to boot. Apparently the advantage gained by the sudden vertical rise was enough to offset the disadvantage of the two additional elbows, and in such an arrangement, in which the flow of air is turned upward in a vertical plane, the two elbows near the bonnet take-off need not be counted as equivalent elbows.

4. *Round, Square, and Rectangular Leader Pipes.*—The equivalent diameter of round pipe supposedly equal in carrying capacity to square and rectangular pipe having given dimensions may be found from tables of equivalent round pipe diameters. These tables are based on quantities of air and hydraulic radii required to give the same friction loss in all cases. The equivalent round pipe diameters of the round, square, and rectangular pipes used in these tests were 10-in., 11.0-in. and 11.1-in., and the corresponding areas were 78.5, 95.0, and 97.6 sq. in., respectively. These areas have been designated as the equivalent leader pipe areas. The curves in Fig. 13 showing carrying capacities of square and rectangular leader pipes in first-story runs have been designated by *T* and *Q*, respectively. At a register air temperature of 180 deg. F., the carrying capacities in B.t.u. per hr. per sq. in. of equivalent leader pipe area were approximately 100 for the square and rectangular pipes, and 115 for the round leader pipe. Hence, the effectiveness of the square and rectangular pipes per square inch of equivalent leader area was approximately 13 per cent less than that of the round pipe.

The curves designated by *U* and *R* in Fig. 13 represent carrying capacities for second-story runs with square and rectangular leader pipes, respectively. Since stacks of different sizes were used in the tests, the carrying capacities read from the curves were corrected to those that would have been obtained with a common stack having a stack-leader area of 0.7 and the corrected values are shown in Column 9 of Table 19. The corrected carrying capacities in terms of B.t.u. per hr. per sq. in. of equivalent leader pipe area for a register air temperature of 170 deg. F. are shown in the last column of Table 19. It may be noted that the average capacity of about 126 for the square and rectangular leader pipes was also approximately 13 per cent less than the capacity of 141 for the round leader pipe.

Hence, it may be concluded that for gravity warm-air heating systems, round leader pipes are relatively more effective per unit equivalent area than either square or rectangular leader pipes.

Better Home Heating's Cleaning Service

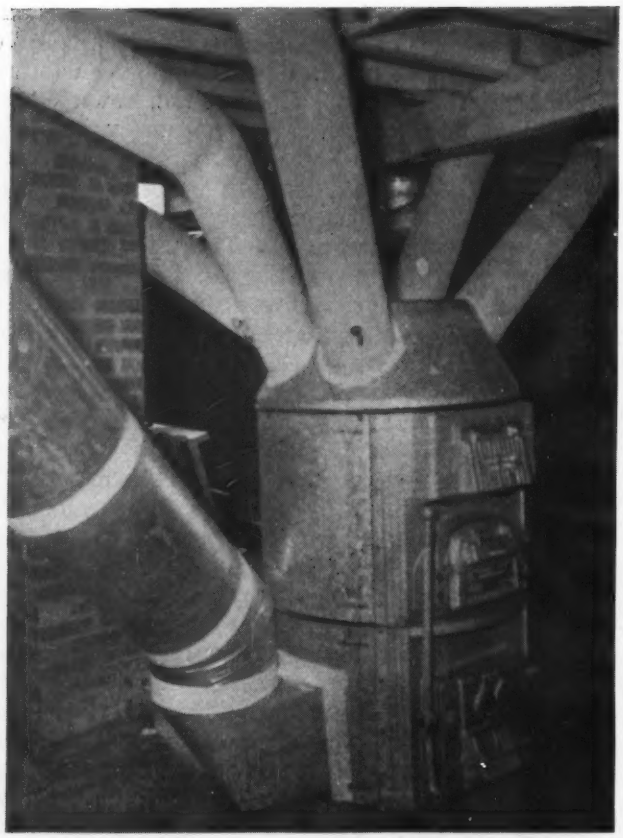
FURNACE conditioning is one of the major objectives of *Better Home Heating* Furnace Conditioning Plan and was designed to assure consumers of getting the kind of service required, and to protect the interests of customers. The 21 points covered by the heating firms offering this service are as follows:

1. Complete inspection of furnace, checking for leaks, broken parts, cracks, warped doors or grates.
2. Check warm and cold air pipes, and inspect all register connections for leaks, or for hot water plants inspect boiler thoroughly for water leaks.
3. Take down smoke pipe and vacuum clean thoroughly.
4. Inspect twist damper in smoke pipe to make sure it is in proper working order and placed correctly in the system with relation to the check damper. (If not functioning properly, this damper can cause a great waste of fuel.)
5. Clean radiator of furnace, or flues of hot water plant.
6. Clean out any scale inside of furnace, which includes feed section, firepots, grates and inside of doors. Special wire brushes, scaling tools and vacuum cleaner to be used in this operation.
7. Remove ashes and clinkers from ashpit. Place in container furnished by customer.
8. Recheck ashpit door and damper fittings.
9. Cement clean-out extension and smoke collar.
10. Adjust grates so they mesh properly and shake freely.
11. Clean lower chimney from smoke pipe opening to base.
12. Check upper chimney for obstructions of any nature.
13. Re-cement smoke pipe into chimney and furnace.
14. Vacuum clean outside of furnace.
15. Vacuum clean outside of cold and warm air pipes, or water pipes (in furnace room only).
16. Brush with wire brush the metal parts of the

(*Continued on page* 80)

Standardized Gravity Systems in Tri-City Area

[*Defense House Heating*]



Coal fired, 18-inch furnace, cast iron, with six leaders on most houses, but a seventh where an attic is floored but not finished. Note all papered leaders with stripped return airs. Small furnace permits steep pitch to leaders.

◆

IN THE Midwest's Tri-City area (Rock Island and Moline, Ill., and Davenport, Iowa) small house building for war worker families has been progressing at a fairly constant rate since the war began. The need for housing is great because of the increased employment in the government's arsenal and in the many important war plants in the area.

Most of these houses have been of standardized war design, quite similar to the houses shown in the accompanying photographs and plans. All houses have full basements—the basementless house has not proved popular in the area. Practically all the heating plants installed in 1942 and 1943 are gravity types, mostly using coal as fuel, but a few installed in 1942 used gas.

Tri-City Building Program

In the Davenport section of the Tri-City area, the heating firm of W. E. Born (a father and son combination) probably has installed the most new house heating systems. Their furnaces have been installed for Davenport Builders, a group of lumber yards constructing houses, and for several other individual and combination building groups.

At the time these photographs were taken, W. E. Born had thirty installations under way, had completed fifty-three installations in 1943, and had more to come. In 1942, the firm installed thirty forced air, gas-fired systems, plus 180 coal-fired, gravity systems. The firm also installed gutters and downspouts (of metal) on most of these same houses.

The typical installation worked out by the firm is a simple layout showing an economy of critical material and standardized to eliminate all but one or two sizes of pipes, registers and grilles. Such a typical system is shown in the illustrations.

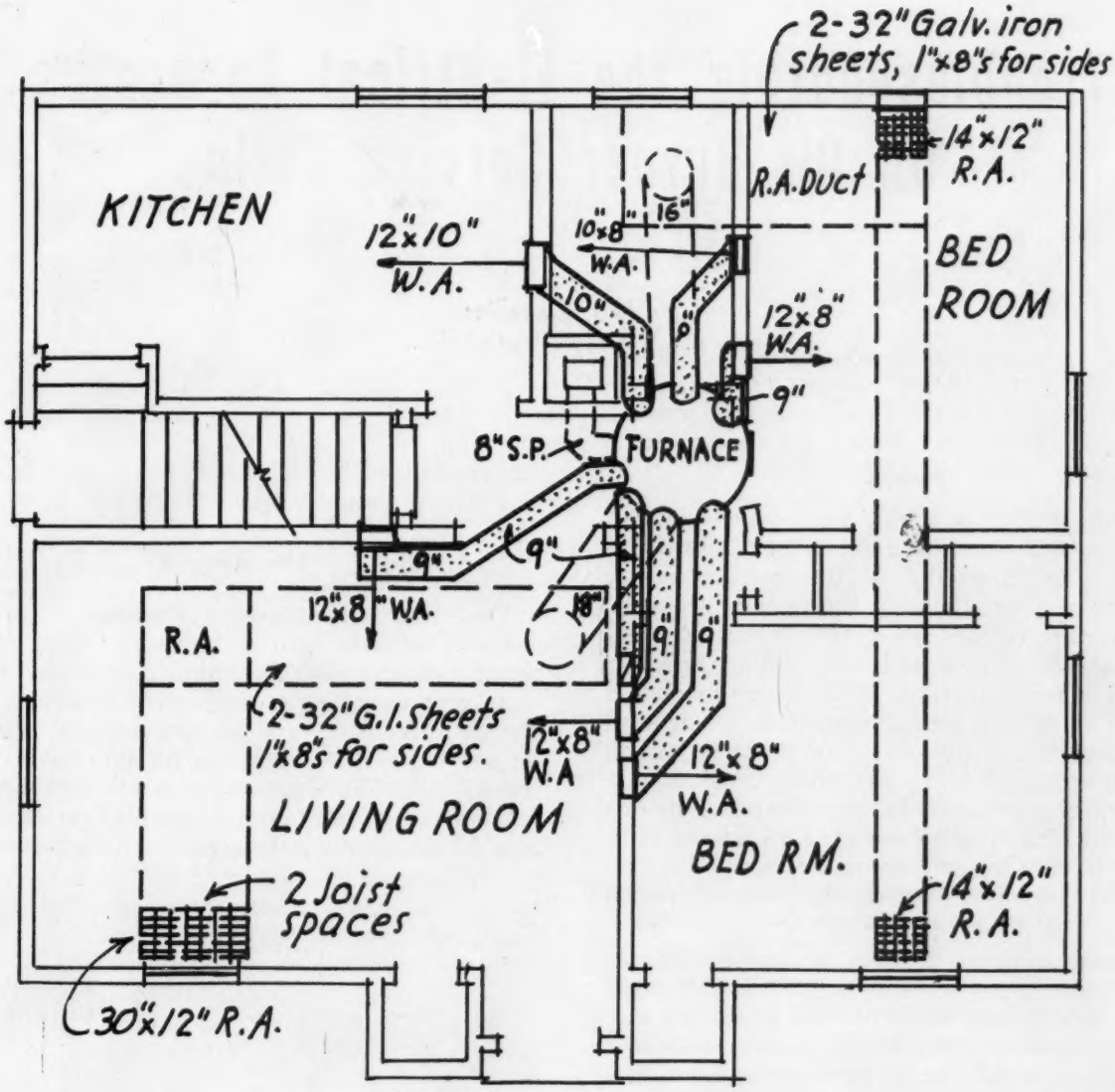
Born's Material Saving Ideas

Construction permitted to date in Davenport includes all warm air pipes and all fittings to be made of metal and favors warm air pipes papered. Cold air runs between joists are panned with metal and the space is not lined with paper. Cold air runs across joists are full metal ducts. No transitions are used between the cold air duct and the drop. The drop and the boot are metal. The only paper used on the cold air system is the joint strips.

The approximate heat loss of these houses is 32,000 B.t.u., so an 18-inch cast iron furnace (Williamson) gives sufficient safety margin for quick pickup.

In the first houses the builder wanted warm air pipes sized precisely to the room heat loss, but Born convinced the builder that considerable time and cost could be saved if the warm air pipes were confined to one or two sizes. The result is that 9-inch pipes are

Davenport's war worker housing program in 1942 and 1943 has been mostly houses of this type and size. Heating system shown in plans.



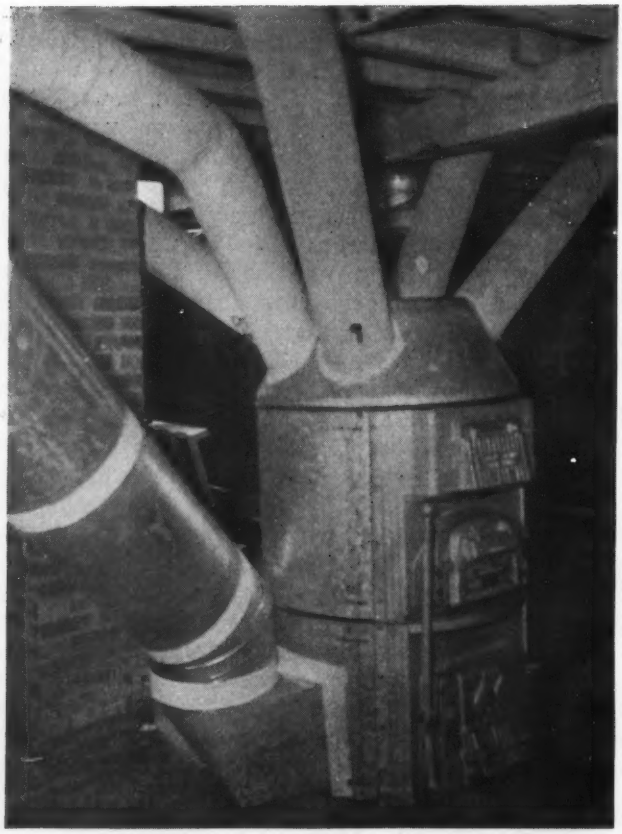
Above—Plan of house with heating system superimposed. Note how Born's recommendation for leaders and registers of one size eliminated much special fabrication and standardized installation. Returns are metal panned or full metal. Below—Born had metal rain carrying equipment in stock, so WPB permitted all metal instead of wood or no gutters at all. Gutter is ½-round with rectangular spouts.

used for most rooms with one 10-inch pipe to the kitchen on the exposed corner. Register sizes were held to 12 by 8 on all 9-inch pipes, all registers in the baseboard, with one 12 by 9 floor register in the kitchen.

After completing 1942's program, the Born firm asked the builders for an outline of their 1943 programs and obtained the contract to install furnaces. A crew of four men then worked steadily during the winter making up the warm air pipe work and papering it; also making the fittings (angles, boots, boxes, elbows); also the unpapered galvanized iron return air pipes—all from flat sheets. By this foresight the firm was ready as soon as construction began this spring to put its force on erection and to keep pace with the builders' programs.

Metal Gutters and Downspouts

As stated, the Born firm also installed the gutters and downspouts, which are metal, as shown in one photograph. The half round gutter runs all around the house with four downspouts, which empty onto the lawn. Permission to use metal gutters and downspouts was obtained on the basis that the Born firm had on hand a large amount of metal gutter and downspout purchased prior to the war and was willing to use the material without trying to replace it and waived all priority requests.



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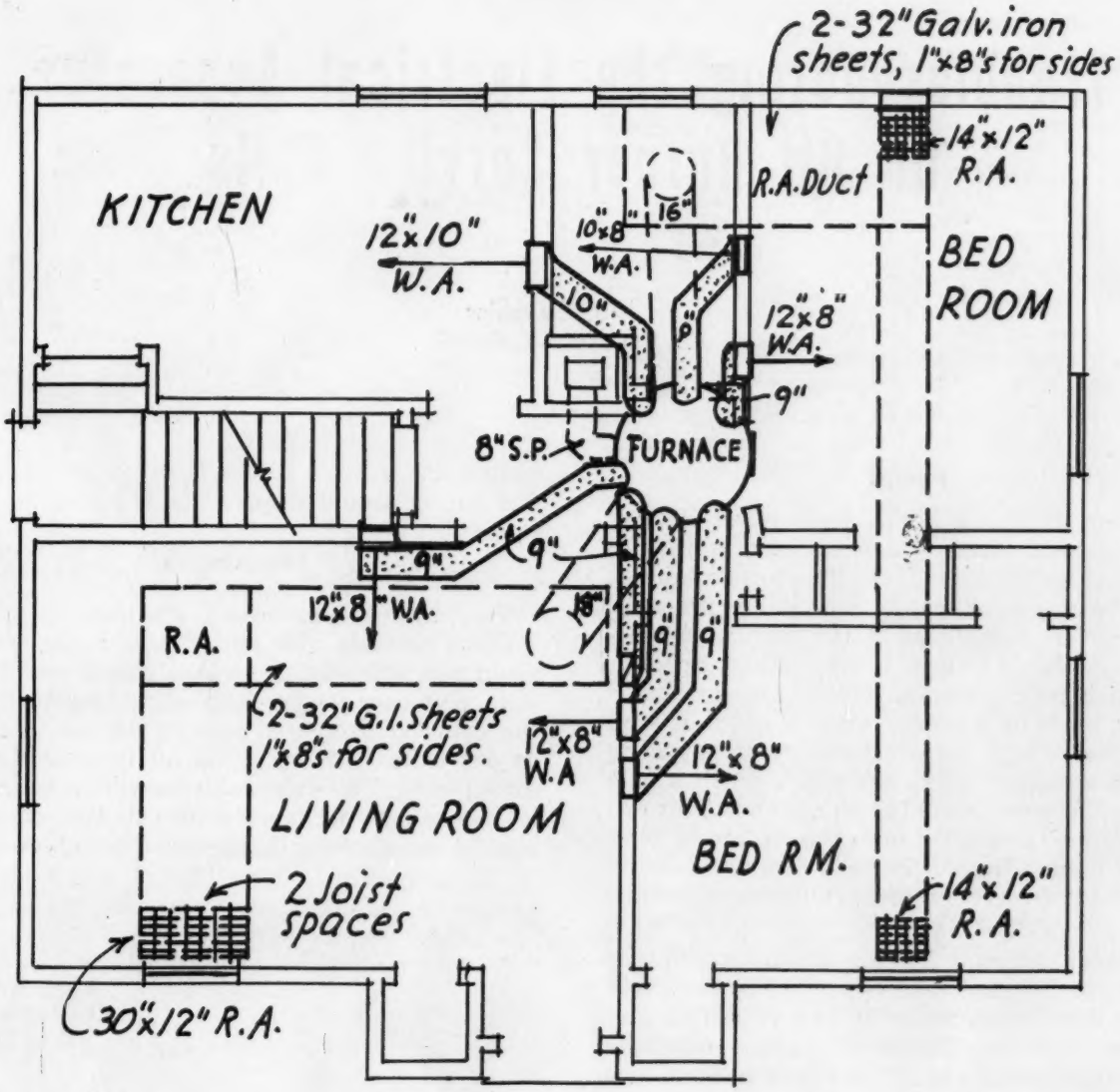

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Troubleshooting the Electrical Apparatus On Oil Burner Service Calls

By J. J. Cavellier
J. J. Cavellier Co., Detroit

Pumps

A pump, though a highly precisioned piece of equipment, will stand up under a lot of abuse. Its purpose is to bring oil from the storage tank to the nozzle at approximately 100 pounds pressure. All pumps are factory set at 100 pounds. A pressure gauge should be used to set it higher or lower as the job may warrant. Major repairs should never be made by a service man—replace or send it into the factory for overhauling. It is well to carry an auxiliary pump set which consists of a motor and a pump mounted on a stand. This can very easily be connected onto the oil burner temporarily in case the service man does not have an extra pump of correct rotation and size of mountings.

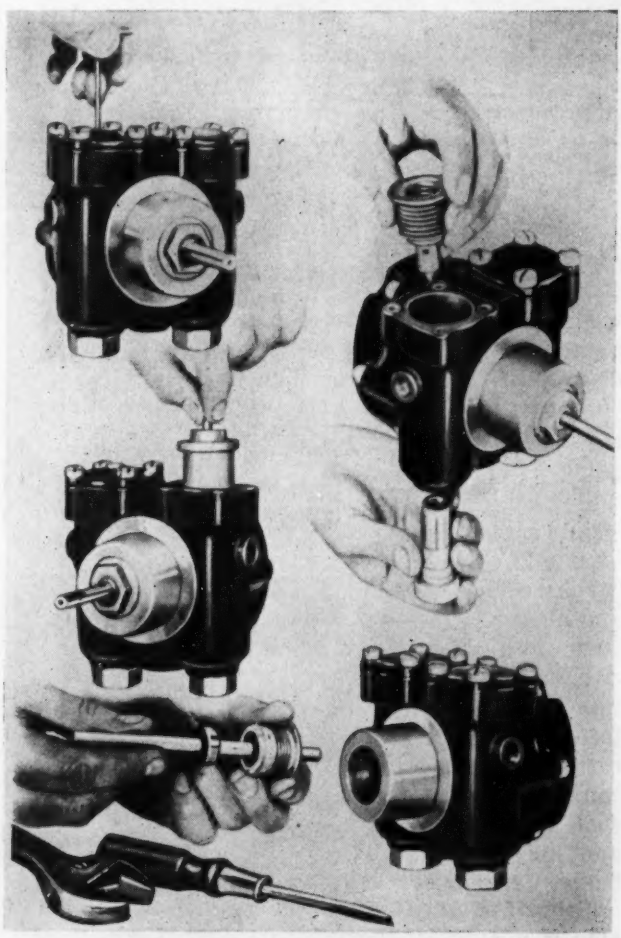
The most common trouble in pumps again is dirt—the screen should be removed and thoroughly cleaned with hot water or fuel oil before any other measures are taken. If gaskets on cover break, either replace or, if none are at hand, use thin coat of Permatex. Be sure when taking any parts off of pump to mark them so they will go back exactly as removed. Pressure regulating valve may be taken out and inspected for scored cylinder, dirty needle valve or seat, or for sticking. In this case clean thoroughly, apply a little lubricating oil and move cylinder back and forth several times to make sure it operates freely. Never use harsh sandpaper or emery cloth. If gears are to be inspected, which one might do if oil is not being delivered to the nozzle port, remove plate very carefully and check pin in gears. If pin is sheared off, replace with a new one, or if not available, a piece of nail or hard metal cut to size will keep the pump going. This is a makeshift repair, but it will give temporary heat. Shellac the pump plate before replacing and be careful not to get any shellac in the gears.

A great many "no heat" calls are caused by running out of oil. In this case, on single line jobs, air must be removed from the pump and line. This is called venting or priming. Remove plug, usually in the regulating valve chamber, and drain off enough oil to completely purge the line. A pint is usually sufficient. The burner must be in operation while doing this. Resetting the safety switch in the panel is necessary to start the burner. After the oil is removed, shut off switch and replace plug. Turn on switch again and burner should start.

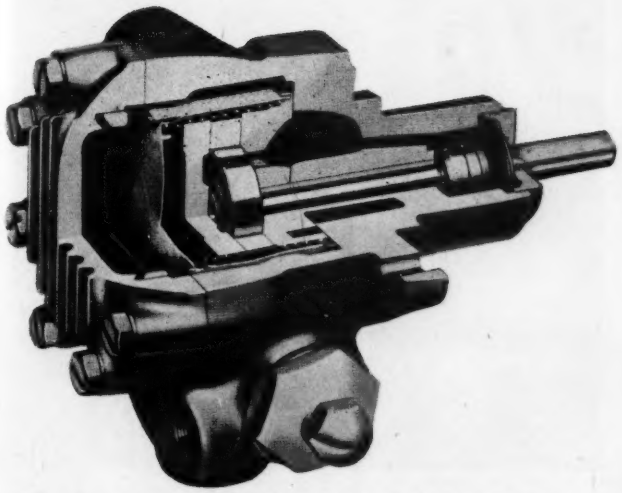
Thermostats

Very difficult for a novice to adjust.

Clean contacts with an ordinary calling card—avoid scraping with a pen-knife or screw-driver. It is very easy to get descriptive literature from the manufacturer, and as long as you intend to do service a little study on all types will never come amiss. The thermostat should, of course, be located where the temperature in that area will also be satisfactory throughout the remainder of



The Webster Electric Co. Fuel Unit shows how easy it is to service modern equipment. Upper left—adjusting the pressure. Upper right—cleaning the valve. Center, left—cleaning the strainer. Lower—inspecting the seal.



Cutaway of the Sundstrand Model S-1 Fuel Unit showing how the strainer can be removed without disturbing other parts, the independently located valve and the anti-hum diaphragm.

the house. Warm walls, cold corners, drafty or sunny locations should be avoided.

Relay Panels

The purpose of a relay or a protective relay is to provide the burner with an automatic means of starting and stopping at the demand of the thermostat and to safely shut the burner off in the event of some abnormal condition. In case burner does not ignite, this control shuts the burner off completely in one to two minutes. (May vary in different controls.) This necessitates recycling before burner can be again put in operation after trouble is remedied. A dirty fire will deposit carbon on the stack control, causing it to act slowly or fail completely. After cleaning and replacing, be sure that contacts are in the starting position, otherwise burner will not come on automatically. Unless you are very familiar with this control, never resort to pushing relays in by hand or a puff may result.

Contacts should be smooth—not burned or pitted. They should make and break firmly and quickly. If they do not, then clean again with calling card, smooth paper, or crocus cloth. Panel should be located close to the heating unit and at least a foot or more away from a draft regulator. Stack relays, like all other controls, vary in type and design, some using metal contacts, some mercury tubes, and some a combination of both. If either of the last two are used, check for cracked tube or oxidized mercury in tube. This is detected by mercury being dirty in color and separating readily. In either case, change tube. This condition in a tube applies to all mercury switches such as pressure switches, vapor switches, fan and limit controls, etc. Metal contact, if pitted badly, can be repaired by smoothing off with an ignition file; of course, new contacts are preferable if available.

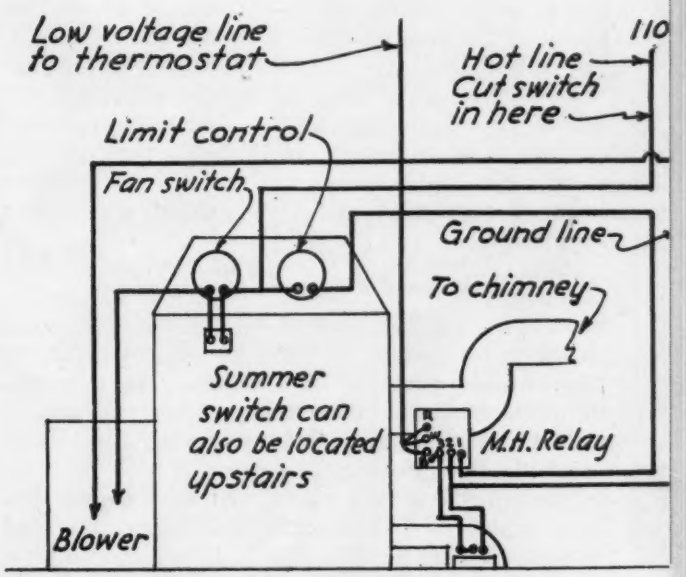
Fan and Limit Switch

These switches can either be two separate units or both embodied in one unit. Their purpose on a forced air system is to turn the blower on at a predetermined temperature, for instance, 150° Fahr., and to shut the burner off at approximately 200°. Contacts in these should have the same attention as in the relay. An overloaded or too large blower motor will cause heavy arcing and burn the contact points. Adhere strictly to manufacturer's ratings.

Transformers and Electrodes

Transformers and electrodes are the ignition system of an oil burner. Again dirt should be kept clear of the wires and points. Connections should be kept tight and any evidence of cracked porcelains or burned electrodes be replaced. Keep in mind that the transformer is 10,000 volts and any carbon or excess dirt can easily ground it, causing an ignition failure. Don't take any chances trying to tape up or repair faulty ignition systems. It just doesn't work. Replace the parts or a puff may result. Oil burner transformers or motors sometimes cause very annoying radio interference. One should always be sure that all parts are securely grounded. Most transformers now have radio condensers built in them. Occasionally an ignition transformer on an oil burner will cause what is known as a "kick-back" in the electrical circuit anywhere in the house. This may result in a badly burned light switch, continually blowing bulbs in a certain fixture, or even burning wires in the house lighting circuit. It is most often indicated by constantly blowing light bulbs, usually of 60 or 100 watts, because of the type filament used in these. This condition is also known as a "surge" and is best corrected

(*Continued on page* 90)



Typical forced warm air-oil burning furnace wiring diagram with burner operated by thermostat; fan operated from bonnet temperature; limit switch set to stop burner ahead of thermostat; and high-low voltage relay and transformer.

Left—One of the duplicate stoker-fired, 495,000 Btu furnaces in its shallow concreted pit. One furnace will maintain comfort in mild weather or on week days. Above—The high vaulted church posed the problem of keeping all the warm air from rising to the ceilings. Twenty mushrooms (see photo below) spread pools of warm air over the floor and prevent floor drafts.

20 Floor Mushrooms Keep Floors Warm In a Vaulted Ceiling Church

FOR the heating of a large Ft. Wayne, Indiana, church, heating contractor J. W. Loney designed and installed the system shown in the plans. The interesting feature is the introduction of warm air for the auditorium through mushroom heads spotted around the floor under the benches with return air taken out along outside walls through narrow floor grilles.

This design accomplished two important results. First, warm air is introduced at low velocity at the floor at sixteen points thus eliminating cold floor drafts so often resulting from high velocity, high-side wall registers blowing over the heads of the congregation. Secondly, no wall cutting was necessary; only holes through the floor for register necks and return grille boxes reduced carpenter and sheet metal work to a minimum.

Also interesting is the use of two stoker-fired furnaces with registers from each system so located that either system may be used in mild weather to obtain at least two-thirds uniform distribution over the auditorium. As a result, in mild weather, either furnace can be and is used to maintain satisfactory temperatures with resulting fuel savings.

The church janitor and board have found that as a result of this flexibility of operation and economical fuel consumption it is cheaper to keep the building at 65 to 70 degrees all through the week than it is to stop heating between Sundays. Temperatures can quickly be brought up to comfort, the building is continually warm, extra-early firing is not required and the fuel cost, because of stoker operation, is satisfactory.

As the interior photograph shows, there is a large auditorium with vaulted ceiling and a large balcony. Had warm air been introduced above the heads of the congregation and at high ve-

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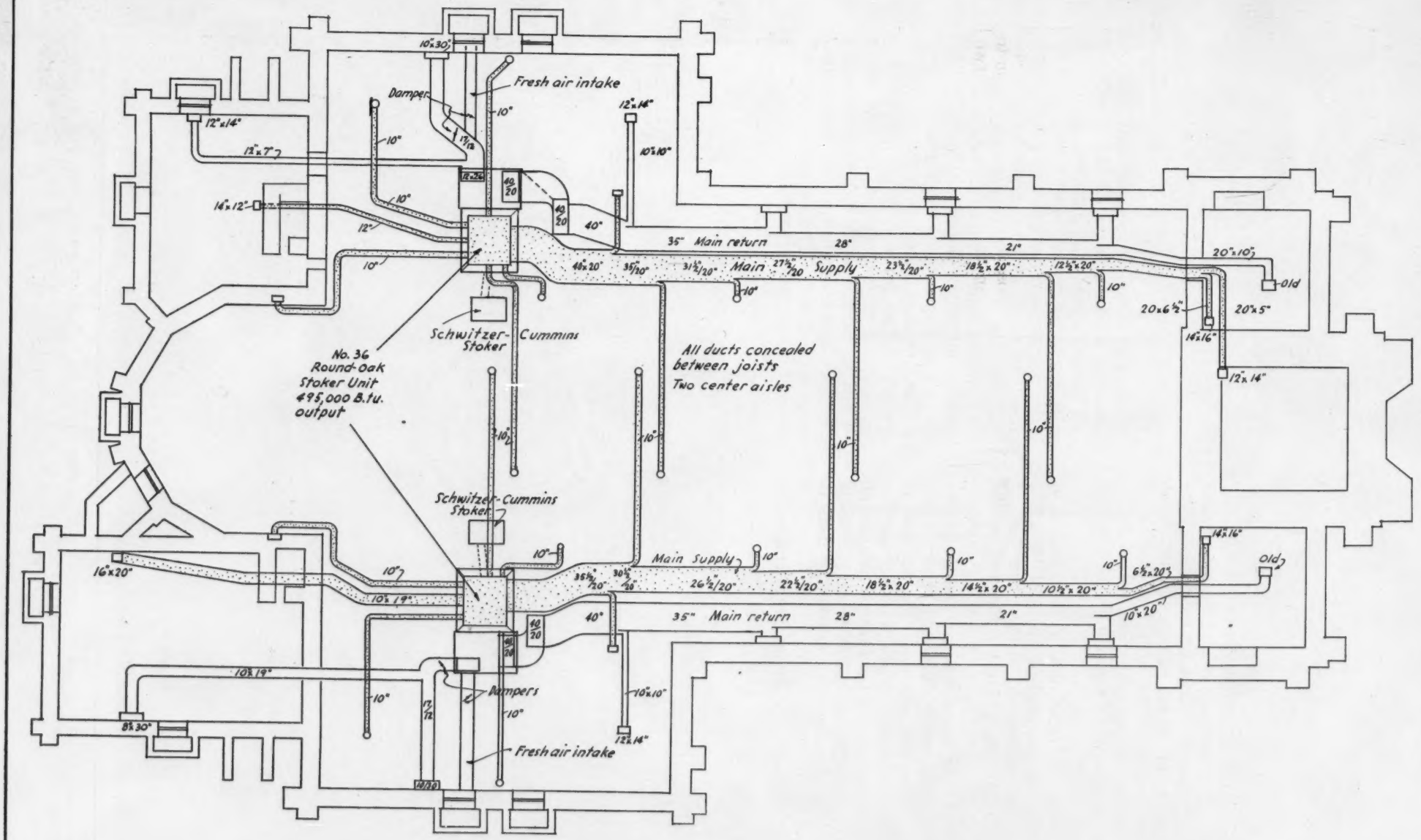


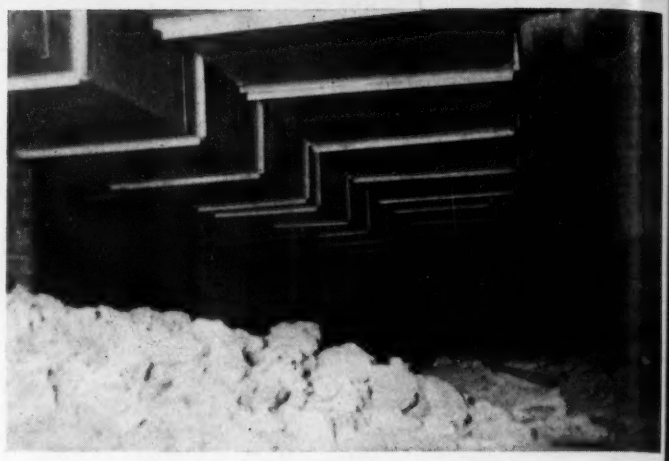
locity, the air stream quite likely would have risen along the center line—perhaps before any noticeable warming effect was obtained at the floor. In this design the warm air still rises, but its warming effect first heats the floor from the sixteen floor "pools" so that there is no draft. The several cold air grilles along the outside walls set up a slow moving current and keep cold air at the walls and away from the members.

The balcony is similarly heated by mushrooms under the benches and air is returned by collecting from a trough which runs along the front edge. The vestibule, the apse, the individual rooms, as shown on the plans, are heated by individual floor registers from one or the other of the furnaces.

Each furnace is rated 495,000 Btu output at the bonnet making a total of about 860,000 Btu output at the registers to meet a heat loss of 650,000 Btu for the 225,000 cubic feet in the building.

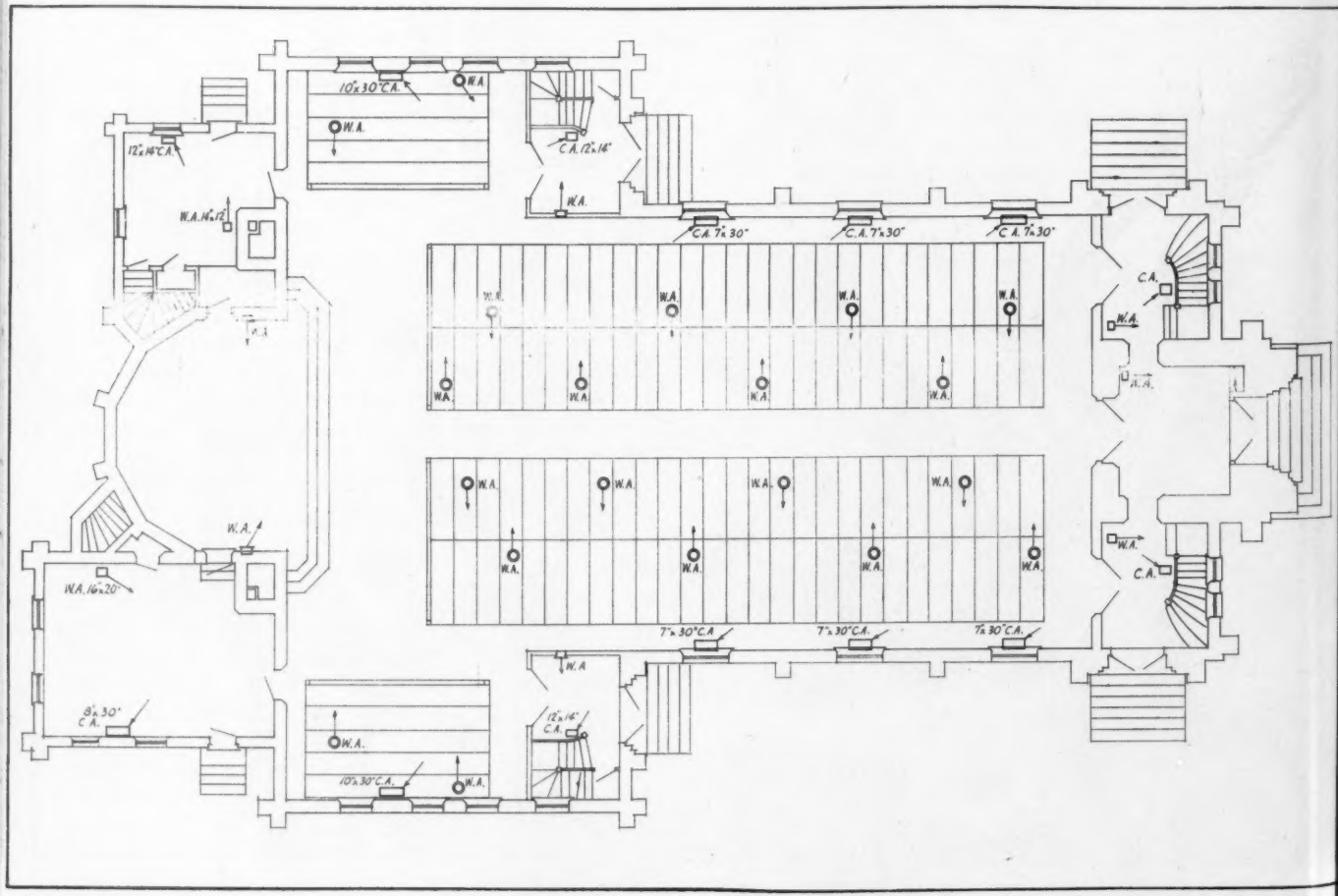
As shown in the basement plan and the photograph of one basement main and return (they are side by side), the area under the auditorium is not fully excavated. Space was dug out for each furnace as shown in the furnace photograph and concreted; then the mains were run along the walls with the necessary excavating done to give access to the ducts.

Warm air and cold air mains are rectangular,



in sizes as noted on the basement plan, but the branches which run out to the mushrooms are all 10-inch round pipe between floor joists. In addition to the mains, some round pipes are run from plenum to registers serving back rooms (see plan). In addition to providing flexibility in heating, the use of two furnaces also simplified the duct work; made mains smaller; and eliminated quite a quantity of large duct work which would have been required for one furnace.

Each furnace is stopped or started by a manual switch at the furnace, but temperature in the auditorium is maintained by one thermostat wired in parallel with both stokers so that one or both furnaces answer the thermostat when heat is required. The fans are operated from bonnet temperature switches.



The basement plan facing and the auditorium plan above show the twin furnaces and twin duct systems, mushroom distribution and registers for special rooms. The photo above shows a warm air and return main through the unexcavated basement.

SHEET METAL SECTION

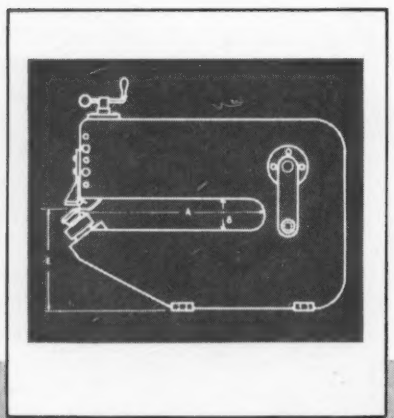
DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING

A NEW HAND-OPERATED ROTARY SHEAR

Here is a fast, accurate tool for trimming light sheets up to 16-gauge mild steel. Light-weight and operated by hand, this machine is readily installed and ready for operation by simply mounting to bench or mobile unit for portable use.

In design, this Model 06 has many distinct advantages. It incorporates the unique Quickwork shearing principle used in the large power operated Quickwork Rotary Shears. In spite of the fact that it has inclined plane cutter shafts, there are no projections beyond the upper cutter. Even the stripper may be removed to facilitate close work or for cutting on short radii. Deep throat, 18 in., permits handling of large sheets.

Power Equipment—Special Attachments—Information on special attachments or power equipment for use with the Model 06 is available on request.



Over-all dimensions: 24″ x 30½″ x 14″. The Quickwork Model 06 Rotary Shear bolts to any bench or mobile worktable. Deep 18″ throat makes it possible to handle wide sheets.

ARMY E NAVY

QUICKWORK-WHITING DIVISION

WHITING CORPORATION

15699-N LATHROP AVENUE, HARVEY, ILL.

Waste Material System Checking Procedure To Determine If You Can Add

[Part 1]

More Machines on the Old Fan and Motor

By H. M. Nichols

Manager, Dust Control and Conveying Dept., B. F. Sturtevant Co.

AS THE difficulty of obtaining fans and motors continues to increase, contractors will receive more and more requests from distraught customers to revamp their existing waste material collecting system, so that additional machines may be used with the existing fans and motors. Efficiency in power consumption, waste collection and separation, long the goal of the designer and operator alike, has now become a secondary consideration and many expedients which would not be considered in normal times may now be resorted to, although it should be kept in mind that there are limits to what can be done in the way of expanding an existing waste collecting system. Naturally if the original design was liberal with plenty of suction at the hoods, large mains and fans and motor conservatively loaded, then much more can be accomplished than with a system loaded to the limit at the start.

In determining what can be done to expand an existing refuse collecting system, the first step is to obtain performance data on the various elements of the system. The more important factors are itemized in the following list: in which fan speed and motor load are musts. If motor load is difficult to obtain, motor temperature will serve as a guide to probable load.

Test Data to Be Obtained From Existing System

(1) Fan speed.
(2) Motor load.
(3) Suction at the hoods.
(4) Minimum suction which will do the work.
(5) Fan Suction and Fan Pressure.
(6) Air volume handled by fan.
(7) Pressure Drop Survey.
(8) Temperatures of motor windings and rotor.

(1) *Fan Speed* is preferably measured directly at the fan shaft, or if this is impractical it can be computed from the motor speed and pulley ratios, making sure that the belts are not slipping.

(2) *Motor load* where electrical instruments are available, can be determined by the plant electrician. If instruments are not available, the power company will usually make this test for their customer. Be sure that the electrical readings are reduced to horse power input to the motor. A rough guide to the motor load can be obtained by comparing the amperes input to the motor with the full load ampere rating shown on the motor name plate.

(3) *Suction at the Hoods* should be taken in the branch about eight inches from the throat of the hood. Test holes should be drilled; if punched the resulting inside burr distorts the readings, especially where the test is made by holding the end of a rubber tube over a pin hole, on the outside of the pipe.

(4) *Minimum Suction which will do the work* can be found by partially closing the branch blast gates and observing the collecting efficiency at the reduced air volume.

(5) *Fan Suction and Fan Pressure* are preferably measured with a standard pitot tube, although they can often be obtained to a fair degree of accuracy by holding the end of a rubber tube over pin holes drilled in the suction and discharge mains adjacent to the fan inlet and discharge. The test hole should be located in a straight section of the pipe as elbows or other obstructions cause interferring eddies in the air stream.

(6) *Air Volume Handled by the Fan* should be measured where suitable instruments are available. Detailed instructions for making fan tests will be found in the Standard Test Code for Centrifugal and Axial Fans, published by the National Association of Fan Manufacturers, Detroit, Michigan. Where suitable test instruments are not available or there is difficulty in obtaining reliable pitot tube readings, which require long straight ducts at the point of test, or there is interference with the pitot tube by dust or materials in the air stream, the fan volume can be determined from the fan manufactures performance tables and the motor load.

The procedure is to plot performance curves for fan horsepower and static pressure (at the operating speed) against air volume and then spot the net horsepower input to the fan as determined by motor test on the horsepower curve. Air volume and fan pressure corresponding to this horsepower can then be read directly from the appropriate scales. It will be observed that only one condition of static pressure and volume corresponds to any given horsepower, and as the

horsepower curve for radially and forwardly pitched fans of the planing mill type is quite steep the air volume is determined quite accurately. This method is not so useful with backwardly curved fans of the Silentwave type, since the horsepower curve for such fans is much flatter. However, the great majority of refuse collecting systems are powered with planing mill type fans which are ideal for this method of test.

If standard performance data for the fan under consideration is not available, most fan companies will furnish the contractor with a suitable performance curve on request, if they are given the complete name plate data of the fan, together with the operating speed. Fan curves for a given speed can be converted to any other speed using the following basic fan laws: volume varies directly as the speed, pressure varies as the square of the speed and horsepower varies as the cube of the speed.

Performance Chart Reading

As an illustration of the method of determining air volume and pressure of a fan by means of standard performance curve and horsepower consumption, refer to Fig. 1 which is a curve prepared for a Number 40 Des. 4 Sturtevant Planing Mill Exhauster installed in a typical grinding wheel exhaust system. The fan operates at 1370 R. P. M. and the observed output of the motor is 8 horsepower. Spotting this figure on the horsepower curve (Point A) and reading down to the bottom scale we obtain 3700 C. F. M. as the air volume handled by the fan. Following up this vertical line until we reach the static pressure curve (Point B) and then reading across the plot to the pressure scale, we find that the corresponding fan static is 7.6 inches.

(7) *Pressure-Drop Survey* involves starting at the beginning of the longest branch and finding out what pressure drop occurs in the various elements of the exhaust system. In some cases it will be found that a somewhat shorter branch of small diameter has a greater drop than the longest branch in which case the branch of greatest pressure drop should be taken as the start of the survey. While not an extremely accurate method of test, pinhole static readings taken on the side of the pipe will answer, as the objective is to obtain a relative idea of the pressure loss through the branches, mains, collector, and other elements of the system. The drop or pressure loss between any two points is, of course, the difference between the pressure readings at these points. To check the exhaust system for points of excessive pressure loss, plot the readings on a chart as illustrated in Fig. 2. Places of high loss will stand out as steeply rising lines and these places should be carefully gone over to see if the pressure losses can not be reduced.

(8) *Temperatures of Motor* windings and rotor are useful guides in deciding how much overload a given motor will carry, since motors of various designs and of equal horsepower ratings vary considerably as to the actual temperatures obtained under equivalent operating conditions. Motor temperatures are specified on the Centrigrade scale and it is desirable to use a Centigrade thermometer in taking motor temperatures. However, where a Centigrade thermometer is not available a Fahrenheit thermometer may be used and the observed readings converted to the Centigrade scale by the formula—

$$TC = 5/9\ (TF-32)$$

where, TC = Temperature by Centigrade Scale,
TF = Temperature by Fahrenheit Scale.

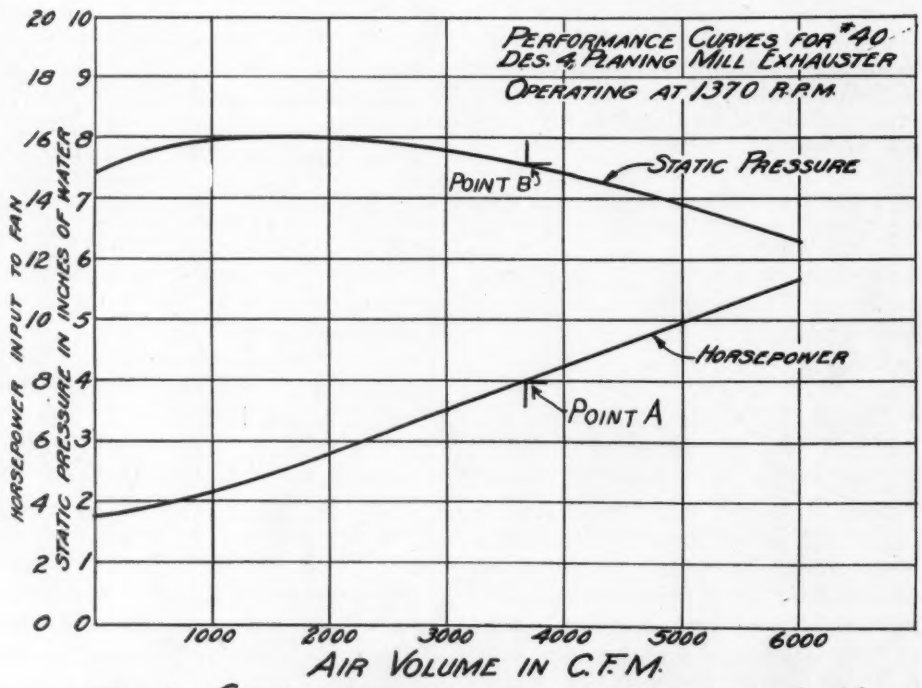


FIG. 1. CURVE ILLUSTRATING METHOD OF DETERMINING AIR VOLUME AND PRESSURE OF FAN FROM HORSEPOWER INPUT.

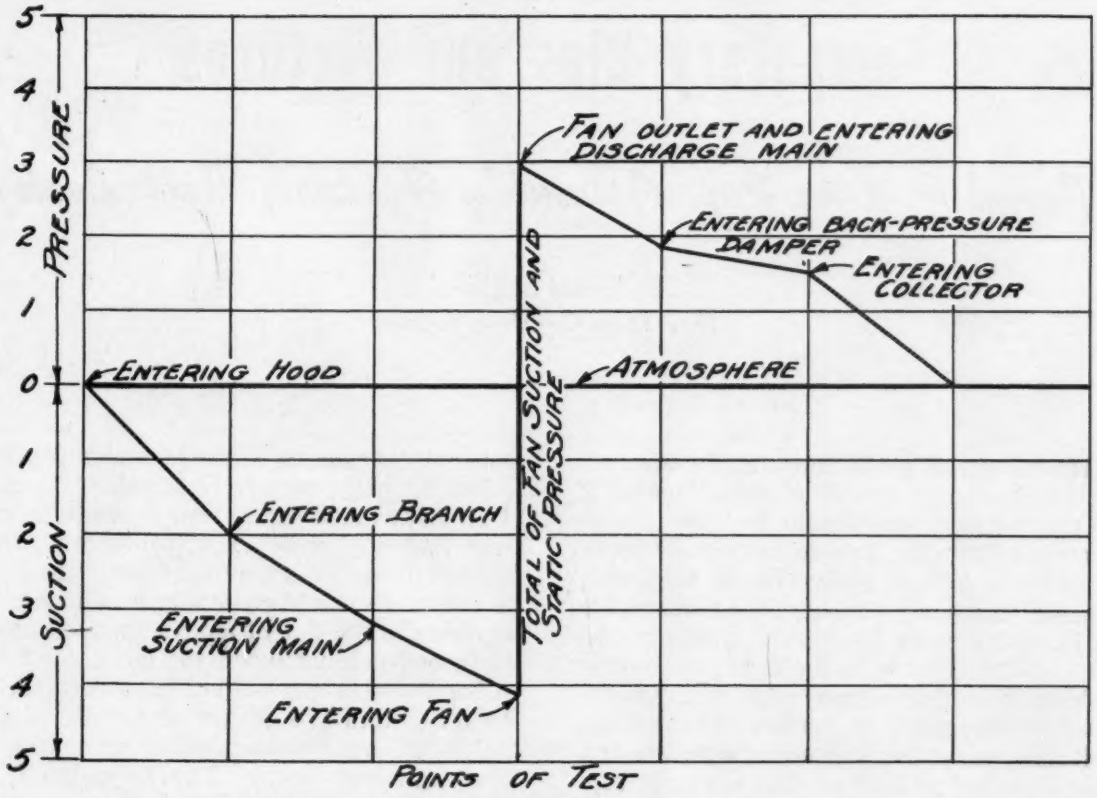


FIG. 2. PLOT OF PRESSURE DROP SURVEY FOR A TYPICAL REFUSE CONVEYING SYSTEM.

If it is desired to convert a certain number of degrees Fahrenheit to Centigrade degrees, as distinguished from a temperature reading, multiply the Fahrenheit degrees by 5 and divide by 9.

In order that the motor may reach its maximum temperature, the equipment should be operated under normal load for several hours, then shut down and temperature readings taken at once. In taking these readings place the bulb of the thermometer directly on the point to be tested, protecting the bulb from outside air currents by placing a small piece of cotton waste on similar material over it. The protecting covering can be held in place with strips of electrician's tape. Another method of excluding the outside air is to cover the thermometer bulb with putty.

Alterations That Compensate for Additional Machines

With the completion of the tests the designer will have a good idea of the performance of the existing system; he will know what margins, if any, are available in motor horsepower, motor temperature, and operating suction at the hoods, and can proceed with the consideration of the various possible changes which may be made to increase the capacity of the refuse collecting system.

Motor Overload Limitations

One of the first considerations is how much additional capacity can be obtained from the existing motor. This can be estimated from the test figures in comparison with the manufacturer's standard ratings. Motor ratings are based on operating the motor in an ambient (room) temperature not exceeding 40 degrees Centigrade (104 degrees Fahrenheit). If room temperature is less, the motor will usually carry a greater load within the maximum temperature limit, while if the room is above 104 degrees Fahrenheit then the load carrying capacity will be reduced.

Open type general purpose motors are designed to carry full load with a temperature rise not exceeding 40 degrees Centigrade (72 Fahrenheit) when operating in a room temperature not exceeding 104 degrees Fahrenheit. Enclosed motors are similarly rated for 55 degrees Centigrade (99 Fahrenheit) temperature rise. Standard manufacturer's ratings approve 15 per cent overload for open motors with no additional load factors for the inclosed type. No definite temperature ratings are given for the overload factor, but the average motor will usually operate satisfactorily up to a maximum temperature of 95 degrees Centigrade (203 degrees Fahrenheit). It is not safe to exceed this temperature without definite knowledge of the motor design, since cotton insulation begins to change above this temperature. There are of course motors having welded rotors and high temperature insulation which will operate at higher temperature, but before exceeding the usual maximum temperature of 203 degrees Fahrenheit the motor manufacturer should be consulted, giving him the complete name plate data for identification.

[Part 2 will follow]

Temporary Dies and Fixtures

(Panel Raising Rig, Assembly Fixture, Bolt Lock)

By Ernest E. Zideck
Sheet Metal Consulting Engineer

SHEET metal shops engaged in aircraft work in which smooth outside riveting is strictly insisted on by inspection, should find the attachment shown in Drawing 1 useful, especially if the riveting is being done by inexperienced help, with the "bucking" not always meeting the force of the riveter, in which cases the "peen" meets no resistance and buries itself in the metal, producing dents which it is almost impossible to eradicate and which the inspection will notice and condemn.

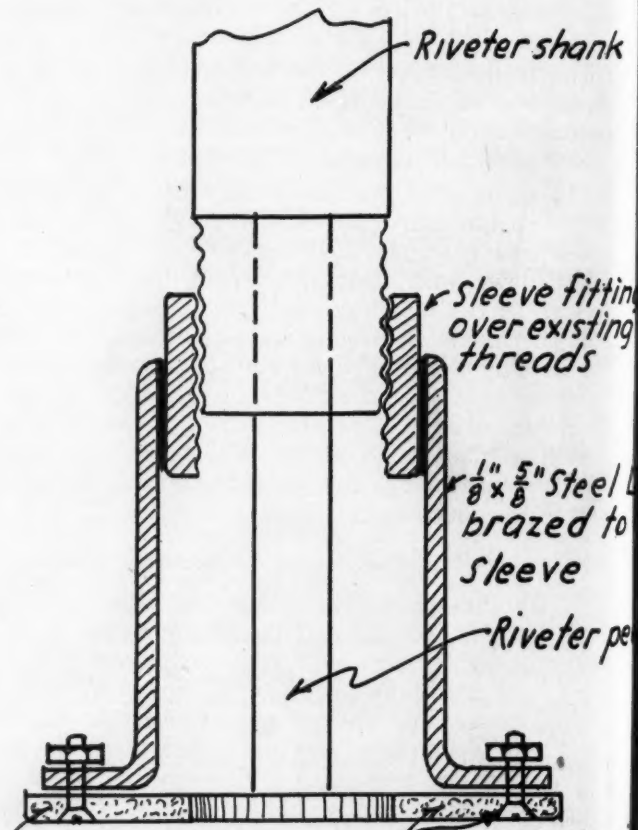
The riveting gun shaft is provided with threads, originally intended to hold a coiled wire contraption which was supposed to act in a different manner than the here illustrated Attachment does. The original coiled wire basket is often discarded by the operator because he (or she) can not see the use of it. The present attachment differs in that the hard rubber or leather washer is held in place by arms or angles which permit of clear view of the peen covering the rivet. The threads provided in the gun shaft are made use of; a sleeve or bushing is threaded to fit over the original threads, with the arms brazed to it, the arms holding the washer by bolts as shown.

The washer is about 3 inches in diameter, at least ¼ inch thick, holding by buried bolts through 3 arms, which may be ⅛ by ⅝ inch flat stock (the narrower the better), so as to leave plenty of clearance to watch the peen through it. The threading bushing admits of adjustment to the length of the peen. The bottom of the washer is on a level with the peen when it hits the rivet. By pressing the riveter against the skin, the washer automatically lays down over the skin, causing the peen to hit straight and preventing it from going deeper than the washer itself. With a proper adjustment the Attachment does away with the peen denting the skin.

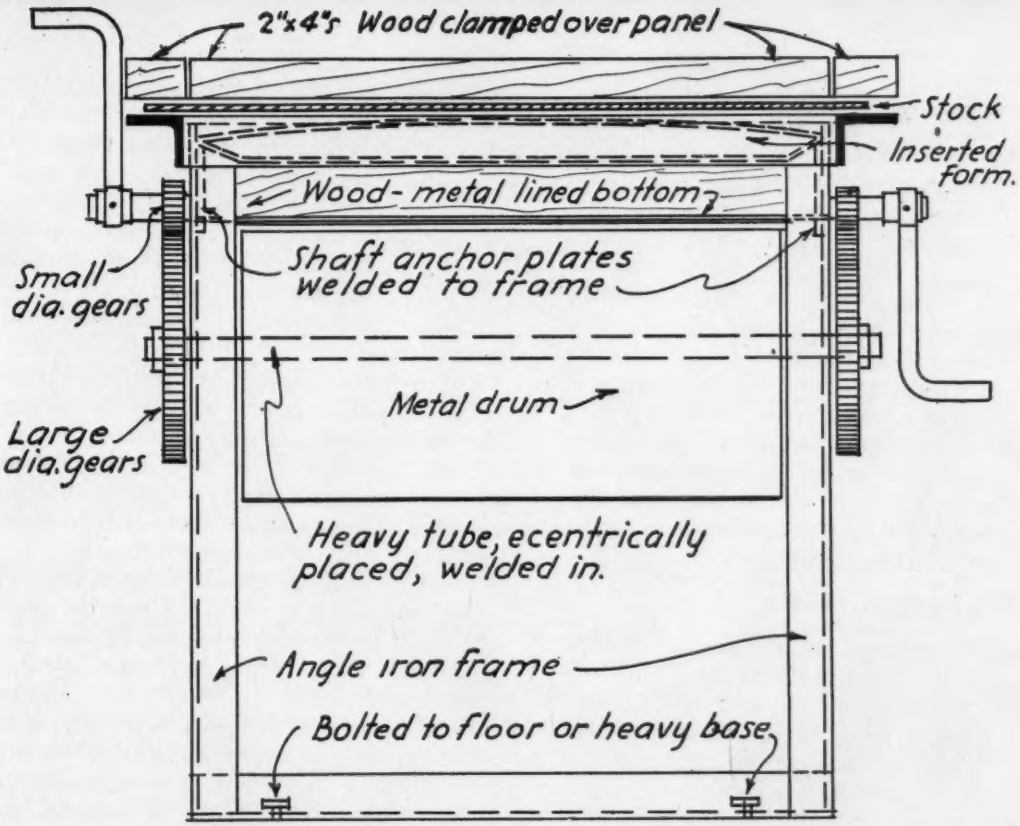
Panel Raising Rig-Up

In Drawing 2 is illustrated a Panel Raising Rig-Up employed in multi-radial formations of the metal. Formerly in automobile body building and now in aircraft, metal panels are raised for stiffness, smoothness of the exterior and prevention of rattling. In aircraft, the raised panel withstands the pressure of the air and eliminates what in aircrafter parlance is called "oil can": metal acting like the bottom of the old time oil can did, "springing" inward under pressure and outward with pressure removed.

In Drawing 2 the fixture is made up of angle iron frame ⅜ x 3½ x 4 inches, with the posts welded to the bottom and the top. The top frame is shown so placed as to admit of clamping two-by-fours to the ⅜ inch thickness of the angle iron, the wood holding down the stock for "raising". A hard-wood construction, lined with sheet metal on its bottom and fashioned to receive and hold a "form" on its top side, moves freely within the angle-iron posts. The form itself may be either wood, masonite, casting or wood lined on


Riveter shank
Sleeve fitting over existing threads
⅛" x ⅝" Steel brazed to Sleeve
Riveter peen
Hard rubber or leather washer.
Bolts buried in washer

Drawing 1, Attachment to Riveting Gu



Drawing 2, Panel Raising Rig-Up

the forming top with metal pre-raised to shape and smoothness by hand. The form reposes freely within the heavy bottom; it can be lifted out and replaced by another, having more or less "raise", just as the panel calls for.

The "Raising" Drum and Gears

The rotating drum inside of the iron frame (which also may be wood), in this case is a fairly well preserved, smooth oil drum. Through it, placed eccentrically, is inserted a ¼ inch thick x 2 inch steam pipe, welded to the respective ends of the drum. A ¾-inch thick boiler plate is bolted to the angle iron on either side, holes in it providing bearings for the protruding pipe. Cast gears have been utilized as shown in the drawing, two large diameter and two small diameter gears, the large ones fastened to the drum pipe and the small ones anchored above, with handles, fashioned of a bent pipe, providing means by which to rotate the drum.

Considerable force is necessary to raise the "form" upward against the sheet of metal and "stretch" it to the shape of the form, especially so if the panel is of a heavier gauge. For this reason, the smaller the upper gears and the larger the lower ones, the more "slow motion" force there will be by rotating the handles, and the operation will not be too strenuous.

Surely, a motor can be adjusted for the operation, or an air hose connected to a cylinder under the wood block to do the work. But this latter arrangement is more exacting. For panel-raising as the "raise" is required in aircraft, the raise not exceeding 5/16 inch per square foot, the hand-operated rig-up shown in the drawing will suffice.

Needless to say, the blank must be tightly clamped to the angle iron to prevent it from sliding out from under the two-by-fours. This operation is "metal drawing or, stretching". To prevent wrinkles forming in the metal, we must secure the blank against slipping and following the form pressing against it. Soft metals, the untreated aluminum among them, will form readily enough. If absolutely necessary to do so we may brake the blank to hook over the angle iron or the two-by-four, the sharp bend in the metal preventing it from sliding in.

Making Small Panels

In case we want to form panels of smaller size in the machine, we insert a correspondingly shaped "form" into the wood block, bolt boiler plate or similar heavier plates to the angle iron frame and advance the two-by-fours or wood planks towards the middle. Another way to make small panels is to use a full size form divided into smaller squares or runs, with pieces of hardwood or steel clamped down across, holding the blank down in the middle or another place corresponding to the underlaying form. The making of raised panels by this method and any kind of a "stretching" arrangement unavoidably requires a wide margin of metal for clamping. This surplus metal is then cut off, largely bandsawed, and constitutes scrap.

In any kind of sub-assembly work and in the final assembly itself it is of great advantage to

do the work in accurately dimensioned jigs and fixtures. Especially in the construction of parts which must fit other parts, is it necessary to do the work in rigid fixtures holding the individual pieces in position while being riveted or welded. In this assembly work it has been found repeatedly that solid metal frames and jigs welded together are liable to changes in the "vital points", which in many cases must be kept to not more than a few thousands of an inch to fit into the other portion of the structure. Summer heat will expand the jig by enough to move the vital points out of fit. But a graver cause of the jig or fixture losing its accuracy of dimensions has been found in its base, the floor giving way and the weight of the fixture or its rigid connection to the floor responsible for it sagging.

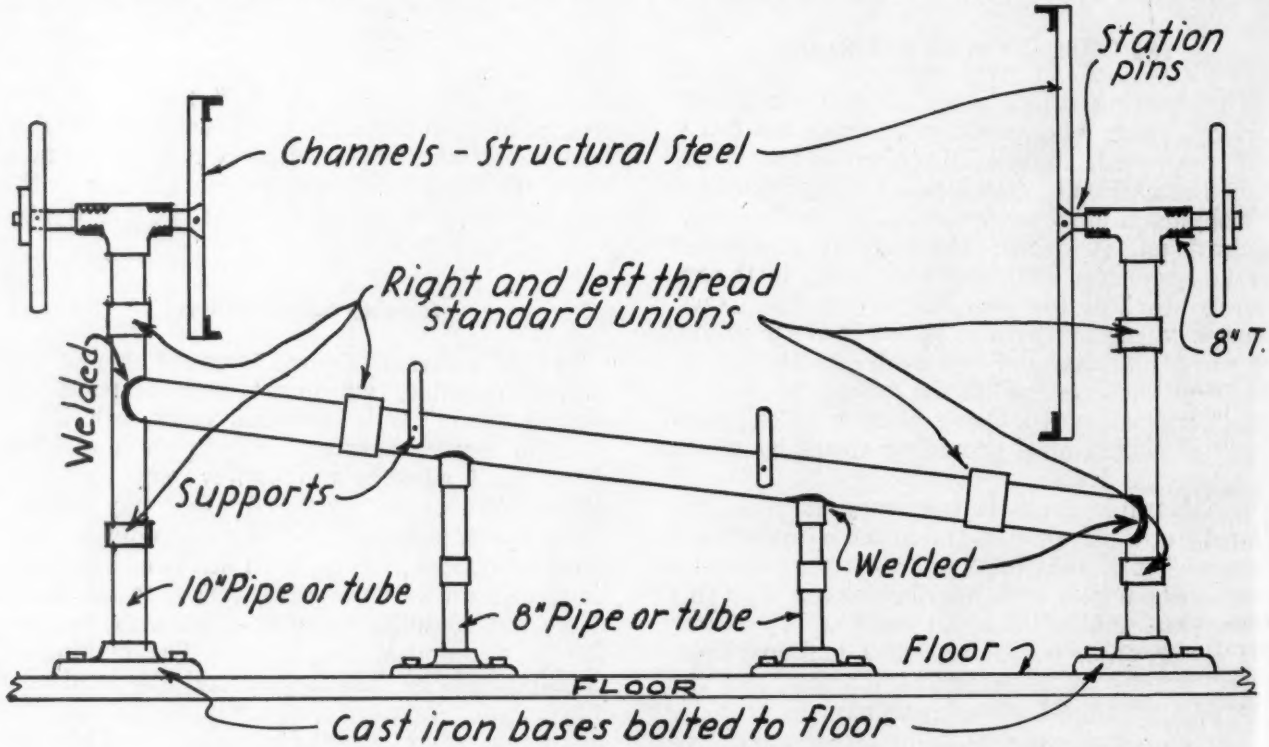
Adjustable Assembly Jig

In Drawing 3 is shown a jig or assembly fixture construction anticipating the above disalignments of vital points, be they caused by a changing temperature or a sagging floor, the construction providing for adjustments by a series of right and left threaded unions facilitating movement of the tubes or pipes comprising the structure. This particular jig was designed for an aeroplane wing assembly, but it may easily be adapted to other parts of the plane, the aft, the mid, the center section for instance, the adjustment of vital points by threading the unions back or forth, as needed, being made easy and secure.

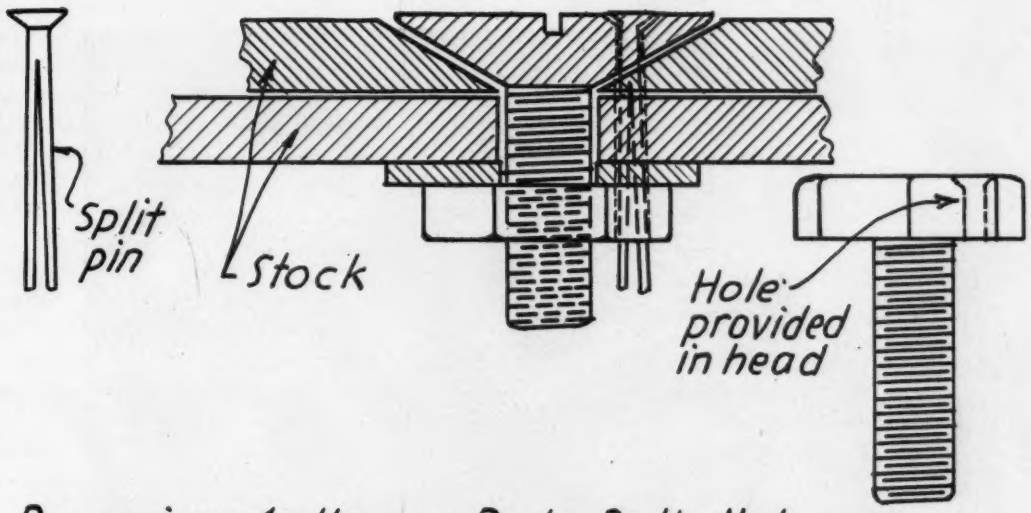
It will be further noted that this jig provides for rotating the wing or the other plane section which happens to be in it, anchoring it in any desired position, this greatly facilitating assembly of parts, riveting, bolting and other work. The two uprights are standard heavy wall 10 inch pipes or tubes, threaded into cast iron bases bolted to the concrete. The connecting tube might be of the same diameter, that depending on the weight of the assembly resting on it. The intervening supports, as many as needed, are 8 inch diameter pipes, similarly threaded into castings secured to the floor. The uprights, the connecting pipe and the supports each show several unions, threading right and left.

The top of the uprights connects into "tees" reduced to 8 inch diameter on the horizontal run, all these fittings being standard threads. To the shaft running through the tees are secured sleeves threading in the threads of the tees. Holes and pins through the metal of the tee and through the shaft facilitate anchoring in positions wanted. This particular jig is provided with structural steel channels, as shown, bearing hinge locating points to which are secured their counterparts for fastening to the wing spars. These channels rotate on a machined part extended from the shaft, pins being used to anchor the channels in positions wanted. After the assembly work is completed in this fixture the pins are removed from the shaft and the hinge-points disengaged by threading the channels outward in the tees.

Supports shown fastened to the connecting pipe are of varying lengths and shapes; they may support the wing in its changing position in the jig, but mainly these supports are useful in holding



Drawing 3, Standard Tube and Fittings Construction Adjustable Assembly Jig.



Drawing 4, Heavy Duty Bolt-Nut for Aircraft and other uses.

the heavy spar in position while the "ribs" fastened to "webs" are being mounted on it. It is the practice to mount the two end webs and only a few in between, and then lower the other spar and fasten it. It is customary to insert the other webs with the two spars in position, riveting both top and bottom at the same time.

Nut Locked to Bolt

In Drawing 4 is shown a novel way of "locking the nut" to the bolt. The illustration gives one use of this device, but there are others, one having the hole in the bolt head tapped for small size bolt. This bolt threads into the head of the larger bolt and reaches through a hole in the nut, the nut in this case having a series of holes, one of them receiving the bolt which holds it from turning. This arrangement is used principally on aircraft cowling with the nuts held in retainers. The drilling of the hole through the stock is not necessary here.

The bolt shown in the illustrations is used for securing heavier gauge metals, angles, bars, spars and such like. The bolt is applied in the usual manner, the nut threaded tight over the stock, and then a hole is drilled through the stock and the nut, the hole in the bolt head serving for guide. A split pin is driven through, the pin expanding below the nut, the expansion preventing its falling out.

Amendment 9, Order No. A-1, MPR No. 188

AMENDMENT No. 9 to Order No. A-1 under Section 1499-159b of Maximum Price Regulation No. 188 issued Aug. 3, provides for a general increase of 9 per cent in the price of cast iron, coal-fired, warm air furnaces at the manufacturers' level, and a corresponding dollars-and-cents increase in price at the jobber and retail levels. The full amount of price increase may be passed on to consumers of the product.

This action was taken after an analysis of volume and cost data covering a majority of products, and subsequent to conference with representative members of the industry. This study clearly revealed that the continued production of cast iron coal-fired warm air furnaces, under previously established price ceiling at a rate calculated to meet essential war and civilian needs, was threatened by the existence of widespread operating losses within the industry.

Analysis of the physical volume of sales of manufacturers who constituted over 50 per cent of the output of this production in 1940 indicate a decline of approximately 33 per cent in 1942, based on 1940 sales. These same manufacturers were operating at an annual sales volume of approximately 50 per cent of the 1940 output during the first quarter of 1943. Other manufacturers, not included in this tabulation are known to have drastically curtailed their output, or to have discontinued operations entirely.

To some extent, the curtailment of furnace output has been offset by conversion to other lines of operation. However, many manufacturers have been unable to convert to other lines, and in only limited cases have those manufacturers who have converted experienced sufficient profitability on the new line to absorb the operating losses on cast iron, coal-fired warm air furnace production.

Data of furnace sales and costs, including raw material and direct labor costs for 1942 and the first quarter of 1943, for 7 producers showed an increase in the first quarter of 1943 in raw material and direct labor costs, as a percentage of such sales dollar, over the full year 1942; these increases in prime costs, expressed as a percentage of the sales dollar, range from four percentage points to 28 percentage points. The seven companies in combination report raw material and direct labor costs as 50 per cent of each 1942 sales dollar. In the first quarter of 1943, these two direct costs account for 63 per cent of each sales dollar. The 9 per cent increase in price, permitted by the accompanying amendment, reflects this 9 percentage point increase with prime costs regulated in the first quarter of 1943 over the full year 1942.

Sadie Malloy operates a punch press in the Edward G. Budd Mfg. Co.'s plant. Mrs. Malloy is Secretary-Treasurer of the War Working Grandmothers Club of America, Budd Chapter, and one of its founding chartered members.

Edward G. Budd Mfg. Co.'s experience with

Women Sheet Metal Operators

WOMEN workers in an industrial plant are no innovation at the Edward G. Budd Manufacturing Company, Philadelphia. There are more of them now and they create a few new problems, but there have been women on the production lines at Budd's ever since the last World War.

In fact, there are at least 25 women who have worked at Budd's for 15 years or longer; there are 10 women who started working there during the last war and are now making modern fighting equipment for the present war. There are women who started during the last war, quit work when peace came, and are now back at machines similar to those they learned to operate a quarter of a century ago.

There are more than two score grandmothers and, until a short time ago, there was a great-grandmother working at Budd's. The grandmothers recently organized the Budd Chapter of the War Working Grandmothers of America, an organization which has since become of national scope with chapters in war plants in several cities throughout the country. The movement is still spreading.

These are a few of the interesting facts about women in a war plant recalled by Dr. E. H. McIlvain, Director of Industrial Relations at the Edward G. Budd Manufacturing Company's Philadelphia plant. The doctor has been in charge of Budd personnel activities since 1915 when, as a practicing physician who had seen extensive experience in industrial medical work in the bituminous coal fields, he was named to head the newly created Budd personnel department. At that time there were less than 1000 employes at the plant. Today there are more than 10,000, of whom more than 2000 are women.

"I recall the night we decided upon the official working garb for our first women employees," Dr. McIlvain said. "There had been much discussion about the problem of properly clothing women so they could work comfortably and safely.

"We had three models dressed in different cos-

tumes parade across the living room floor at Mr. Budd's home while Mr. and Mrs. Budd and I discussed each one in detail. Our first consideration was safety. Our second was appearance because we knew a woman, even though she worked in a factory, would not be happy if she did not like the looks of her working costume. The third consideration was the general utility, comfort and life of the garment.

"The same costume is still being worn by all our women workers. It has proven the soundness of our original judgment through the years. It is a simple combination of an overall blouse which buttons at the waist to trousers of the same material. Some girls wear a waist under the blouse; others do not. The sleeves are long and are buttoned at the wrist. The trousers are of two lengths, depending upon the type of work done. Welders wear ankle-length ones; others wear the knicker length which button at the knee. There is a pocket on the left side of the blouse for a badge and a handkerchief, and two pockets in the front of the trousers for tools. The girls all wear shoes with closed toes and sensible heels. They wear stockings, sox or nothing, just as they please. The safety department provides snood-type hair nets for certain workers whose job requires this protection."

Do All Types of Machine Work

Women employees at Budd's do a great variety of work ranging from gas and electric welding to grinding, polishing and inspecting. Some operate drill and punch presses, some work at lathes and Shotweld machines. Several girls in the aircraft department are learning sheet metal work, having gone to our school to study blueprint reading and the use of the tools of their new craft.

Anne Convery operates this Shotweld machine. She has been welding for more than a year. She once did clerical work in a specialty shop, but likes defense work much better during war times.

"Some of the work our women do is much like embroidery," Dr. McIlvain explained. "Welding small components is as dainty an operation as fine needlework. Women are much more adept than men at jobs of this sort."

As to whether or not women take advantage of their sex in expecting favors, Dr. McIlvain says:

"One of our greatest problems with women workers in the plant, and it is not a serious one, is the habit some of them get of staying away from work or wanting to go home soon after they check in for the day.

"Most of our girls never before made as much money as they do with us and at first they do not seem to be able to stand prosperity. A few of them like to 'party' around at night and then 'sleep it off' in the morning. They report to the dispensary with the story they are tired or nervous, while actually they just did not go to bed

(*Continued on page* 78)

Emma Heine, paint spray operator, and Anna Dobson, crimper, model the costume worn by girl workers at the Edward G. Budd Mfg. Co. The uniform is made of denim in two pieces which button at the waist. The short trousers are permitted for workers whose legs are not apt to be splashed at their work. The longer trousers are worn by those who need the added protection.

Pre-war view of one corner of the extensive Fingles' shop showing duct work for ventilating systems, processing items, and other peacetime contracts in construction. In this corner shears, presses and welding stations provide initial fabrication for parts and pieces.

Mechanics' Work Benches—*Rush!*

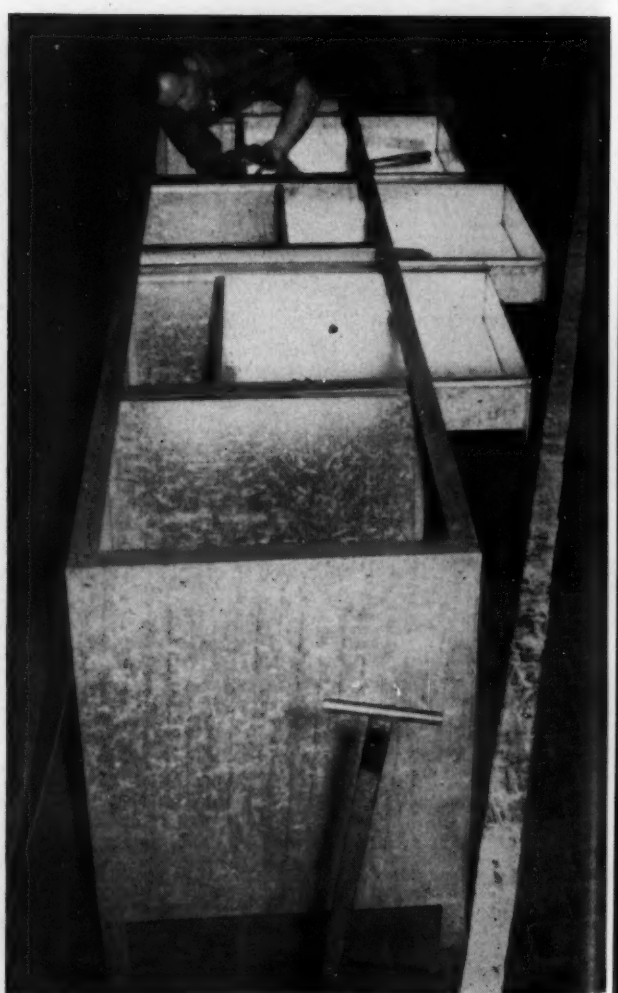
THE Fingles Company, Baltimore, one of the east coast's oldest and best known sheet metal manufacturing firms, a few months ago completed in spectacular time a rush order for special work benches for navy vessels. So rushed was the work that benches were trucked out of the Fingles plant and into the boats while some boats were getting ready to sail.

These benches are sturdy, strong units designed to store tools and parts in drawers and on shelves and provide working surfaces on which ship's carpenters or mechanics can service equipment.

Details of Construction

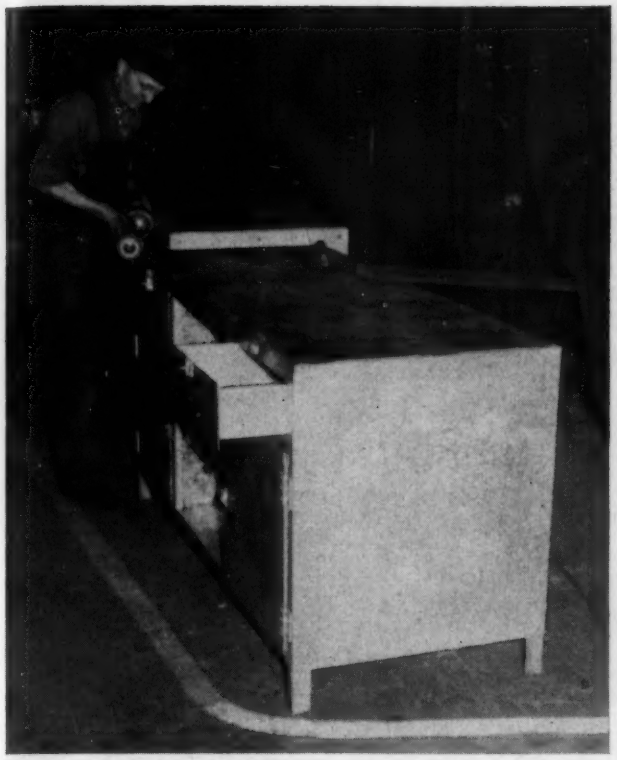
The construction required complete metal fabricating equipment such as Fingles uses in manufacturing its usual production and contracting items, plus special machines used in war item production and employed to fabricate metal duct work on hundreds of ships. Angles had to be cut, formed, welded. Drawers, drawer fronts, drawer hardware had to be formed and welded or bolted. Doors and panels had to be cut, formed and put together. Tops of steel had to be cut; the wood tops were purchased from a local woodworking mill.

The general construction of the single, double and back-to-back units is shown in the construction photographs. The frames were made up of a 2 by 2 by ¼-



◆

Right—A single-faced, double mechanic's bench in assembly. Frame is welded 2 by 2 by ¼-inch angles; panels are single thickness, 14-gauge galvanized iron. Drawers and doors have been previously assembled and are here being installed on tracks and fitted with stops.



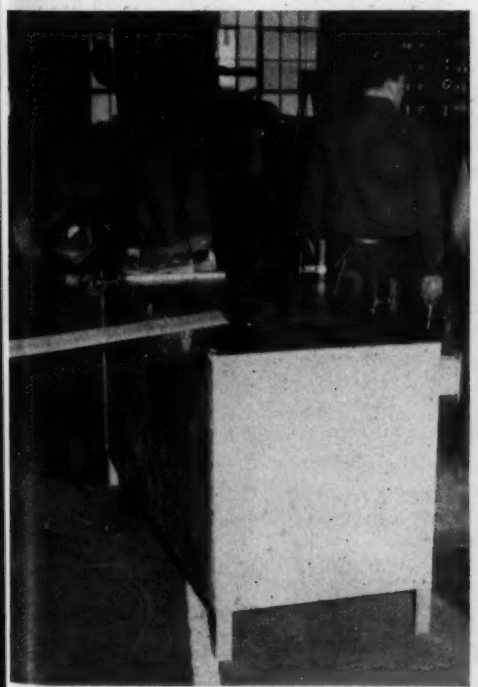
This bench takes a wood top so the steel support top has all welds ground flush and smooth with a hand grinder. On steel topped benches, the front edge extends beyond the face of the bench.

Quick acting plier clamps hold drawer hardware in place while holes are drilled for bolts. Drawers and drawer parts were fabricated and assembled by one crew while another crew assembled the bench.

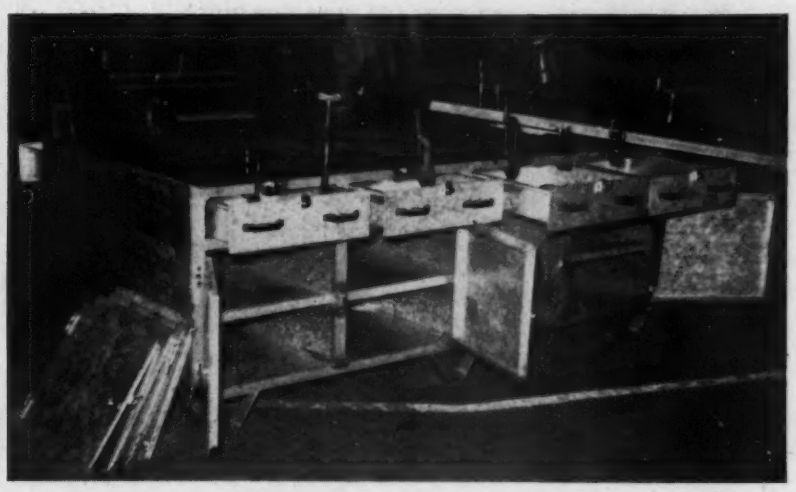
inch angles and 2 by 1 by 3/16-inch channels. Some 1½ by 1½ by 3/16-inch angle was used for slides, stops, etc. All frames were welded into a solid unit.

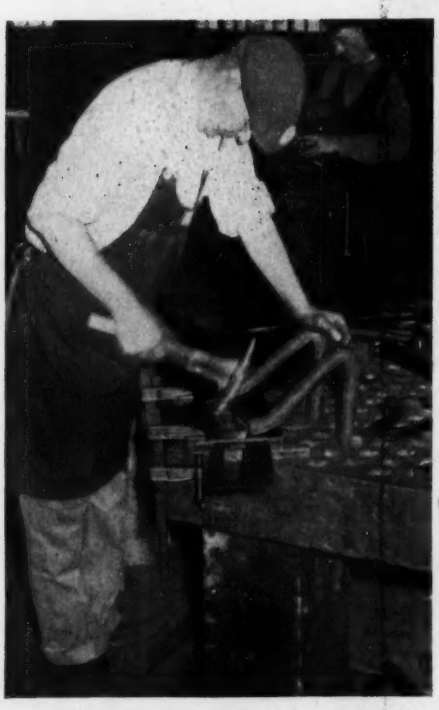
The frames were covered with galvanized iron panels bolted to the frames; these panels, also the partitions, shelves, drawers and other sheet parts were 14-gauge steel. The drawers were equipped with necessary tracks, stops and hardware so one crew was put to work cutting sheets, forming up the fronts, backs, sides, bottoms, tracks, stops and then putting the parts together and attaching the hardware. Thus it was possible to construct the drawers while the frames and panels were being put together. This same crew or parts of the crew also cut, formed and assembled the shelves and doors and attached hardware so that shelves and doors were ready to attach when the bench was ready for fitting.

Both drawers and doors are standard single thick-



Left—A steel top has been aligned and clamped along the critical front edge. Then the back and side edges were tack welded. The stiff ¼-inch cold rolled plate top was held down by the mechanic standing on the top or by a long leverage. Below—Double, back to back and end to end bench with steel top ready to have steel top welded. Note numerous clamps required to hold the heavy top tight against the frame.





Two photographs of manufacture of a 40 mm. shell rack by temporary setups. At left the slots are being cut on a nibbler following a template. At right, the slot is being peened against a die (clamped down) then a die is hammered through the slot to get final dimensions.

ness construction employing standing edges for stiffening (see photographs) with parts bolted together rather than welded.

Steel Top Application

Perhaps the most complicated part of the work was to put on the steel tops and get this top level, aligned and uniformly welded to the frame. This top is ¼-inch cold rolled plate and in the sizes used for the double benches required considerable clamping to prevent distortion and shifting in welding.

As shown in one photograph, the top was aligned along the front edge, since this edge had to be in exact position and the top edge was then clamped to the frame at frequent intervals to hold the edge and the plate in correct position. Then the welding crew tacked the back edge with one man standing on the top at the tack point or putting the top tight against the frame with a long bar if standing on the top didn't make contact.

After the back edge was tacked the same procedure was used along each end edge. After tacking, the top was carefully inspected to see that alignment was correct. Then the welders filled in between tacks until a solid weld was secured around the ends and back. Finally the front edge was tacked and welded.

The top was finished by grinding the welds. On wood-topped benches the supporting steel top was flush with the frame all around, so the weld had to be ground flush and smooth, so the steel would not protrude beyond the wood edge.

A fitting-up crew attached the shelves, doors, drawer tracks, put the drawers in place and checked the assembly for workmanship and fit of parts.

Products by Temporary Set-up

Long before Pearl Harbor the Fingles Company was engaged in fabricating pilot orders or full-production orders for our armed forces. The variety of items produced ranges from very simple to very complicated. Some of this work warranted elaborate and permanent jigs, fixtures, positioners and dies; some of the work has been suitable for only temporary setups. An example of production by temporary setups is shown in two photographs of 40 mm. shell racks where perforations in the rack pieces were made on the nibbler and then the slots so cut were peened on an anvil with the piece held by screw and drive-in clamps. After peening, the slot is trued up by driving a die through the slot.

War Work Supplants Usual Products

For the duration of the war most of the company's peacetime items are suspended—Majestic flashing, stainless steel process items, and numerous metal items used in the construction industry, but the firm is working seven days a week on a backlog of war item orders extending many months into the future. Baltimore is one of the busiest cities in the country, pouring out ships and planes; both requiring many metal items which have been sub-contracted to Fingles. An indication of the Baltimore boom is the addition of more than 200,000 workers from every part of the country to the city's normal one million population.

If you haven't taken any action on joining the new association of sheet metal contractors, or if you have not expressed your ideas on the purposes of such an organization — do so. The next meeting of the sponsors will be in Detroit, August 14. A report will appear in the September issue.

DUX-SULATION

the all purpose duct insulation

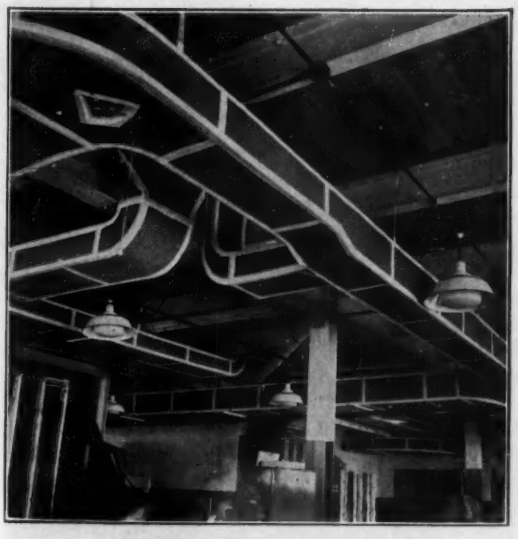
HELPS YOU SPEED UP PRODUCTION by keeping floors in your plant CLEAN, SAFE, and SANITARY — by stopping the dripping and CONDENSATION of overhead metal ducts.

HELPS YOU INCREASE THE EFFICIENCY of the MEN and EQUIPMENT you use daily by making possible uniform and controlled temperature,—by eliminating 70% of sound travel in ducts.

HELPS YOU BOOST up the MORALE of your MEN by simply installing DUX-SULATION on all your duct work,—improving the general appearance of your plant, requiring no painting.

DUX-SULATION has a 75% insulating efficiency (K factor .27 B.T.U.) . . . High sound absorbing efficiency (70%) . . . Low frictional resistance . . . Prevents condensation . . . Will not rot, chip or flake . . . Easiest insulation to apply and looks best . . . Dux-Sulation is easy to handle in stock or on the job . . . Each roll contains 100 Sq. Ft. of standard ½" thickness.

DUX-SULATION is now available for immediate delivery . . . 1 roll or 1000. It comes complete . . . Everything necessary (adhesive and binding type) for its simple application is included in each shipment . . . Nothing else to buy . . . No lugs, screws, bolts, or wire . . . Dux-Sulation's flexibility makes it ideal for round or rectangular ducts, and it cuts without waste.



A finished Dux-Sulation job—attractive and efficient.

Asbestos Protection
No More Spoiled Decorations
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No Temperature Losses
Greater Operating Economy
Quiets Mechanical Noises
No More Drippy Ducts
Sanitary and Clean Floors
No More Rusty Ducts
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Easy to Apply

Specify ASBESTOS PROTECTED DUX-SULATION on all your duct work . . . A Dux-Sulation insulated job gives higher unit-performance at much lower cost.

Write for Bulletin No. 407-A.

4101 WEST TAYLOR ST. **GRANT WILSON, INC.** CHICAGO ILLINOIS

Carry-Back, Carry-Over Loss Provisions Stabilize Earnings

By Arthur Roberts

THE domestic and international problems that will snarl business operation post-war will inject much instability into barter, hence, profit and loss can dip and peak erratically during this hectic period. The warm air heating dealer or sheet metal contractor who comes out ahead will be the one best able to take the bumps in their stride. In pre-war years, with the income tax rate low, the instability of earnings was bad enough, one year a substantial gain, the next a loss, the next a small profit, and so on, ad infinitum, but this could then be overcome by carrying over a surplus from the fat years to feed the lean years. Now, with the tax rate the highest in history and likely to go higher, the dealer or contractor will find that this levy takes such a heavy toll in the profit-years that there will be little to credit to surplus to "cushion" the loss-years.

For this reason, we call attention to two important amendments to the Internal Revenue Code, which will enable you to by-pass the increased hazard of profit and loss irregularity by taking credit in profit-years for losses sustained in other years.

Under the 1939 revenue bill, the taxpayer was permitted to carry over operating losses for 2 years. In other words, losses sustained in 1941 may be carried over as a deduction from 1942 income, and if the loss is greater than 1942 income, the excess may be carried over to 1943. If the loss has not been absorbed by then, you "hold the bag" for the remainder.

Since enactment, the carry-over loss provision has been a big help in enabling business people to effect tax economies and now another tax-saving opportunity has been written into the 1942 bill, permitting you to carry back a loss for 2 years, but not prior to 1941. So, if you experience a loss in 1943, you can carry it back to 1941, a 1944-loss can be carried back to 1942, and so on. If you experience a loss in 1942, you cannot carry it back further than January 1, 1941.

Many dealers and contractors are not aware of these stabilizing provisions in the income tax law and they are so important that we detail their operation here. The figures are not necessarily indicative of the profit and loss experiences of dealers or contractors in this field, but they do illustrate the operations of the carry-over and carry-back loss provisions very clearly, hence, the reader can readily acquire an understanding of this routine and apply it to his own figures.

1941	$500 net income
1942	1,200 net income
1943	1,400 loss
1944	1,200 loss
1945	400 net income
1946	1,500 net income
1947	1,600 loss

You may carry back the $1,400 loss in 1943 to 1941, but you can't go back further than that. Deducting $500 from $1,400 leaves $900 balance, which may be applied to the $1,200 net income you earned in 1942, leaving $300. Now the 1943 loss has been absorbed by the 2-year carry-back with $300 of 1942 net income remaining and there is no loss carry-over to 1944 and 1945. But, the $1,200 loss in 1944 may be carried back to clip that $300 overage, leaving $900 still unabsorbed.

How the Carry-Over, Carry-Back Loss Provisions Stabilize Earnings

Losses in 1943 and 1944, which may be carried back to 1941 and 1942	$2,600
But net income in 1941 and 1942 totalled only	1,700
Balance of carry-back not absorbed is carry-over to 1945 and 1946	$ 900
Profit in 1945, which is deducted from foregoing carry-over loss	400
Leaves balance for carry-over to 1946	$ 500
Net income in 1946	1,500
Net income remaining from 1946 after deduction of carry-over	$1,000
Loss in 1947 that may be carried back	1,600
Loss not absorbed, which may be carried over to 1948 and 1949	$ 600

To this point, you have been using the carry-back amendment, now you switch to the carry-over provision legalized in the 1939 bill. Carry forward the $900 to 1945 and 1946. Deduct the 1945 income of $400 from $900 leaving a loss balance of $500 still to go, which may be deducted from $1,500 net income in 1946, leaving $1,000 unabsorbed. In 1947, you lose $1,600, which may be carried back to the $1,000, wiping out 1946 net income and leaving 1947 with a loss balance of $600, which may be carried over to 1948 and 1949. Before these provisions were legalized, you took such losses "on the chin", now you can take credit for them.

A taxpayer with the foregoing set-up of figures would have no net income from 1941 to 1947 and would, over the years, pay no tax thereon. Many taxpayers, from now, will show profit and loss statements that can be adjusted in similar manner, more or less, even though their net income or net losses differ substantially from the foregoing figures.

(*Continued on page* 80)

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION Says

Dealer Training Books Covering All Warm Air Heating Activities

THE home owner says: "We want a good heating system."

The heating contractor says: "We want reliable information and lots of it."

The furnace manufacturer says: "We want well trained dealers, competent to sell, install, service and maintain our units."

Everybody says: "Why don't the manufacturers get together and arrange for a consistent training program that can be used by any dealer working for any company."

We have heard this clamour; we have been hearing it for years. The first good start towards satisfying this need was made by a special committee headed by John W. Norris two years ago. Due to the pressure of business this initial work was suspended. Recently Guy Voorhees, who is a member of the Installation Codes Committee of the National Association, and I have been appointed to carry on where the work was left off.

The Association has appointed a Textbook Committee composed of the following men:

Chairman, Prof. S. Konzo, University of Illinois.
Assistant Editor, Guy A. Voorhees.
Advisory: J. Harvey Manny.
Advisory: Prof. Lorin G. Miller.
Advisory: John W. Norris.
Advisory: H. F. Randolph.
Advisory: W. D. Redrup.
Advisory: F. G. Sedgwick.
Advisory: P. B. Zimmerman.
Advisory: J. R. Scott.

The plans for the dealer training books are in the making. Please do not send in requests for such books now.

We have plans to make a series of booklets of twenty to thirty pages each which will cover almost every phase of warm air heating, gravity as well as forced warm air. We want booklets that will take up a single topic such as heat loss calculations, or registers, or fundamentals of heating, and cover them fully. We have in mind booklets that will be crammed with pictures, diagrams and sketches to convey the ideas in a simple manner. We have in mind a style of writing that will be conversational in tone. When it is done, we hope that a dealer will be able to cover one subject thoroughly at one sitting.

We have started the mechanism going to collect the material necessary for our booklets. The Installation Codes Committee of the National Association is working on sections devoted to oil burner tank installations, weather data for the country, placement of gravity registers and return grilles, and other items.

We take this opportunity to remind all dealers, jobbers, manufacturers, or salesmen to send us your material or your suggestions:

Specifically can you help us in the following fashion:

1. What subjects do you feel you would like to have us cover in detail?
2. Do you have photographs of some good installational practices? Do you have sketches showing some problems you have met and how you overcame them?
3. If in the postwar period you will be hiring untrained help as salesmen or installers, what sort of background material do you want them to read?
4. Would you like to learn how to figure heat losses quickly and accurately? Would you like to learn how to select gravity duct systems according to the new short cut tables? Would you want a short method for figuring duct sizes for forced air systems used in small homes (not over seven rooms in size)?
5. What sort of information do you want that you could take to your customer prospects? What to your notion is the "crying need" of the industry?

We welcome all comments, all suggestions, and all information about your product and your methods of installing a good system. If you want to unload something off your chest, we are ready to receive the load. Please send all correspondence to Prof. S. Konzo, Mechanical Engineering Department, Urbana, Ill.

As plans materialize we shall keep you informed as to how we shall attempt to distribute the information.

(Signed) S. Konzo,
Chairman of the Textbook Committee.

HISTORY OF THE

NATIONAL WARM AIR HEATING and AIR CONDITIONING ASSOCIATION

By... ALLEN W. WILLIAMS

CHAPTER 5

Research program makes progress . . . oil burners appear . . . forced air comes to front for consideration . . . Standard Gravity Installation Code is adopted . . . Research Residence is built.

WHEN the research program was undertaken, as outlined in previous chapters, no promise was made as to how soon results from the investigation would be available, but less than one year later the first printed Bulletin from the University appeared.

Surprisingly rapid progress continued to be made and Bulletin No. 117, issued by the Engineering Experiment Station, University of Illinois, was published in less than two years from the inauguration of the activity. It was entitled, "The Emissivity of Heat from Covered and Uncovered Casings, Leaders and Stacks." This Bulletin became rather famous because it announced the research staff had proved conclusively that lightweight coverings of asbestos paper or paint on leader pipes resulted in a greater loss of heat than when such supposed protection was omitted.

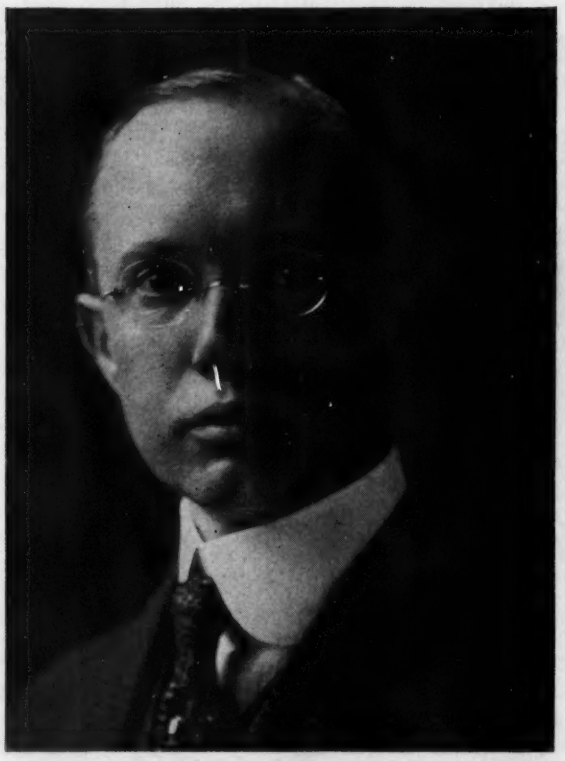
Important information relative to the results obtained from various types of water-pans was also made available and a method was provided in the laboratory for measuring the amount of air flowing in leaders and stacks of a warm-air furnace system. To accomplish this the Research Staff did something that had never been done; that is, they designed and built special equipment which made it possible for them to weigh air on platform scales. In addition to all this a report was made on the efficiency and capacity performance of a pipeless furnace installed in the mechanical laboratory testing plant.

In 1920 the use of oil as a fuel for home heating was brought to the attention of the Association for consideration. A sample of an early domestic oil burner was displayed at the Association's June, 1920, convention. While it was crude when compared with the perfected domestic oil burners of today, it attracted much attention and from that time on the use of oil as a fuel for furnace heating grew in use and popularity.

Forced Air Appears in 1921

Each year some marked improvement in construction, installation or merchandising of the furnace system appeared. In 1921 it was forced air, which was dimly visible upon the horizon. There had been rumors as to the use of fans or small blowers in connection with furnace heating. As far back as 1910 a small number of furnace blowers are said to have been sold. Although the Association's Research Staff believed a gravity furnace plant correctly installed would heat evenly and satisfactorily, the organization's membership wondered whether or not the use of a fan or blower would assure more positive results and possibly make for some economy in fuel. However, it was with a great deal of skepticism that the subject was introduced for the first time at the organization's May, 1921, convention, upon which occasion one fan and one blower were displayed.

Even those in the industry who advocated the use of fans or blowers had little or no idea that before long the use of these appurtenances would make possible the present popular forced-air or mechanical furnace system, nor did they realize the important part which the research activity must and did play in making the use of fans and blowers in connection with the furnace system entirely acceptable.



1. Irving L. Jones, then treasurer of International Heater Co., Utica, N. Y., became president of the Association in May, 1921.

During 1921 the Association's warm-air furnace research continued its splendid progress toward making the design, installation and control of the warm-air furnace an exact science. The information developed was of such material consequence that at the 1921 meeting, Bulletin No. 120, which followed Bulletin No. 1 and Bulletin No. 117, was distributed. This Bulletin was entitled, "Investigation of Warm Air Furnaces and Heating Systems" and contained much helpful data as developed and recorded by Professor A. C. Willard, Professor A. P. Kratz and Mr. V. S. Day, including information regarding "The Piped Furnace Plant as Tested in a Mechanical Laboratory at the University of Illinois."

In May, 1921, I. L. Jones, at that time treasurer of the International Heater Company, Utica, N. Y., succeeded W. G. Wise as president.

A "Research Residence" Is Proposed

As the findings from the research activity were from time to time distributed, a question was sometimes raised to the effect that while results from the investigations had been determined in the perfectly equipped mechanical laboratory at the University of Illinois, would the findings be the same in actual installations? As usual Professor Willard was looking ahead and realized that there were many investigations in connection with warm-air furnace heating which it would be difficult if not impractical to make in the laboratory. He, therefore, very frankly and convincingly recommended that the Association purchase, erect or rent a house of from eight to ten rooms near the University of Illinois in which many of the investigations in warm-air heating and other phases of air conditioning could best be conducted, the University of Illinois' mechanical laboratory still being used for certain investigations.

Professor Willard's recommendation started every member of the Association to thinking, and the more they considered it the more they appreciated the possibilities of such a house, so the Research Advisory Committee was directed to give the matter of the proposed house special study and to report at the organization's next meeting which was to be held in April, 1923.

2. E. B. Langenberg, St. Louis, succeeded Mr. Jones as Association president in 1923.

"Standard Code" Is Written

In the meantime, the demand and need for what at that time would be considered an up-to-date Installation Code was urgent. The investigation in warm-air furnace heating had progressed sufficiently to make possible a code based for the most part on the reliable, unbiased engineering data which the research at the University of Illinois had reported, so at the Association's April, 1922, convention a committee charged with the formation of such a set of rules for gravity installations presented a code which they had prepared.

The record indicates that after much discussion it proved acceptable except as to the method offered for determining the sizes of warm-air pipes, stacks and furnace required for each particular installation. A rule which was simpler and was known as the B.t.u. method was substituted by unanimous approval, and the Standard Gravity Installation Code came into being in 1922 and its publication authorized "in such size as would fit a No. 10 envelope."

The Association was somewhat disappointed to find that the "Standard Gravity Code," which was the title given to the new set of installation rules, was not at first received with any great enthusiasm by heating contractors or by all furnace manufacturers. However, as time went by and it was found the "Standard Gravity Code" was nontechnical, easy to follow, eliminated sick jobs and insured correct installations, it grew in popularity, finally receiving the endorsement of the entire furnace industry, the American Society of Heating and Ventilating Engineers, the National Association of Sheet Metal Workers, and architects. Naturally it was improved in subsequent editions and well over one million copies have been printed and distributed. Today the Standard Gravity Code, more popular than ever, is in its eleventh edition and is now published in 8½ by 11 inch size and substantially bound.

"Research Residence" Is Approved

This code has also made it possible for a home owner himself to check over his own heating plant for safety and correctness and many manufacturers will not guarantee their furnaces for durability or capacity unless the Standard Code is followed in gravity installations. It was a great accomplishment and the forerunner of an installation code for mechanical warm-air furnace heating.

At the Association's annual meeting in April, 1923, the subject of the erection by the Association of a Research Residence was given further consideration. The Research Advisory Committee at that time wholeheartedly endorsed the project and included in its report a general description of the type of house which in its judgment should be erected. The matter was then referred to a joint committee consisting of the Installation Codes Committee, the Research Advisory Committee and the Executive Committee of the Association, who were to report in full at a meeting of the Association to be held at the University of Illinois, Urbana, Ill., in December, 1923.

It was at this meeting that E. B. Langenberg, St. Louis, who in April, 1923, had succeeded I. L. Jones as president, directed the proceedings of one of the

(*Continued on page* 77)

New Products

For your convenience a number has been assigned to each item. Circle the items in which you are interested on the coupon on page 70 and mail to us.

△ Indicates manufacturer not listed in 1942 Directory.

● Indicates product not listed in 1942 Directory.

50—Duplex Jaw Spot Welder

Eisler Engineering Co., 740 South 13th St., Newark, N. J., has recently introduced two types of a new duplex jaw spot welder—bench type resistance welding machines designed for light gauge sheet and wire.

Each unit consists of two independent small welding machines built together with one transformer and a rheostat for finer heat adjustment.

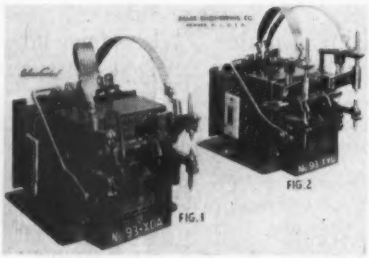


Fig. 1 shows a model of a duplex welder equipped with rocker arm; Fig. 2, one supplied with vertical press arrangement. Both are foot operated by means of two treadles and chains and made in sizes from ½ to 3-KVA. The transformer used in both types has five secondary tap connections providing five different heat positions.

Step-on foot treadle brings the operating jaws together, squeezing the work by means of a lever system. On further pressing on treadle contact is made and high welding current will flow from the secondary through the work until the switch automatically breaks the circuit.

If one treadle is operated the other simultaneously cannot be used, but the machine can be set up to do subsequently and without stopping, two different jobs, with different jaws, for example, welding light and heavier work under different heat positions.

The machines are built for single-phase AC of 110, 220 or 440 volts, 25 to 40, 50 and 60 cycles.

◆

△ 51—Acid-O

George B. Klee Co., 2301 Florence Ave., Cincinnati, Ohio, is manufacturing Acid-o to preserve corroded metal.

Acid-o is applied with a paint brush, although it is not a paint—it contains no pigments, oils or asphalts. Acid-o forms a protective film which cannot oxidize. An application fills rust holes, thus rustproofing and waterproofing at the same time. Its color is black when applied, but after it sets it becomes a slate color.

◆

△ 52—Ucilon—A Coating

United Chromium, Inc., 51 East 42nd Street, New York City, offers Ucilon, a new protective coating for extremely corrosive conditions. Ucilon is formulated with new and improved synthetic resins, and produces a tough, flexible coating that is resistant to organic and inorganic acids, alkalies, salts, alcohol, gasoline, oil, greases and moisture. It has excellent dielectric strength and can be applied to wood, metal, concrete and other surfaces by brushing, spraying or dipping.

Ucilon F is a special formulation for use in contact with food products.

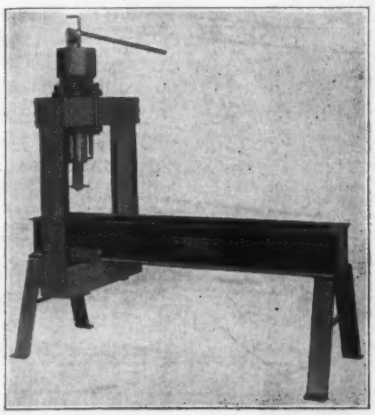
A 12-page data bulletin is available.

◆

△ 53—50-Ton Press

Bee Line Company, P. O. Box 569, Davenport, Iowa, has improved their 50-ton hydraulic press for all types of press work that require pressure within the limits of 50-ton capacity.

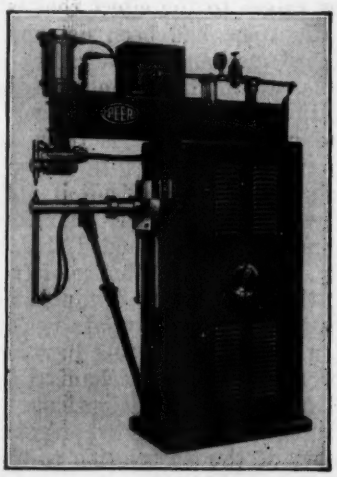
The press is available with an 84 or 96-inch bed. The press itself is fitted



to the bed with machine slides in order that it may be moved to any point within the entire length of the bed. A range of flexibility is also provided by the support construction which permits the head to be moved crosswise. The press has 16-inch clearance between the end of the ram and top of the bed—ram travel 7 inches, quick-acting screw in ram travels 7 inches, making a total stroke of 14 inches obtainable.

54—Automatic Spot Welder

Pier Equipment Mfg. Co., Benton Harbor, Mich., has designed the new P-20 automatic press type spot welders to meet present day high speed production requirements. Control of pressure, weld time, hold time, off time, and speed up to 110 strokes per



minute is entirely automatic. No effort by the operator is required. The new P-20 provides for variations in the cycle to suit each welding job.

The upper electrode is actuated by a double acting air cylinder and electrode pressure range can be adjusted by air pressure regulating valve. Current may be adjusted from 50 per cent of maximum to 100 per cent by the eight-point selector switch. Each of the two capacities made, the 20 KVA and the 30 KVA, are available with throat depths of either 12 or 24 inches.

◆

55—Victory Finishes

Maas and Waldstein Company, 483 Riverside Drive, Newark, N. J., offers a new line of wrinkle finishes, containing no Chinawood oil.

These new "Victory" finishes closely resemble the standard wrinkle finishes now restricted by government order because of the Chinawood oil shortage. These new finishes form hard, durable coatings, cover rough metal surfaces effectively in a single coat, and are applied in regular wrinkle patterns by the same methods. They are obtainable in a full range of colors.

Association Activities . . .

Illinois

The July 10 report to members of the Sheet Metal Contractors Association of Illinois contains a letter to the Illinois trade from President Ed. Pluth. In this letter President Pluth says that the periodic bulletin idea inaugurated by former Secretary W. W. Johns and former President Peterson will be continued. President Pluth calls attention to the accomplishments of the immediate past administration in successfully fighting for a higher than A-10 rating for P-84 work, and in getting deferment for sheet metal and furnace men called to the colors. Suggestions are invited from the trade, and members of the trade are cordially invited to become members. An attractive membership plaque ready for framing is offered new members upon receipt of their $3.00.

Secretary W. R. Shaw of Jacksonville reports on the first directors' meeting at Peoria to lay plans as to how the association can best serve its members in this hectic war year.

President Pluth, Secretary Shaw, George Harms and Directors Joe Walters and Erwin Eichenberger attended the organization meeting in Chicago of the new national sheet metal contractors, now forming. The directors decided that the Illinois association continue its cooperation with the national group and voted to have Pres. Pluth, Secy. Shaw and Director Walters attend the next national organization meeting, after which a further report will be mailed to the trade.

Treas. Frank Eynatten, in his report to the directors, showed the finances of the Illinois association to be in splendid shape with all convention bills paid.

It seemed to be the concensus of opinion that regional meetings would do much to spread the news of the value and work of the Illinois association to every contractor in the state, and would tend to increase the membership. President Pluth appointed the following as District Governors for the territories shown, to arrange these regional meetings:

W. W. Johns of Urbana: Urbana, Champaign, Danville, Mattoon, Decatur
E. Eichenberger of Peoria: Rockford, Springfield, Quincy, Rock Island
Joe Walters of Ottawa: Ottawa, LaSalle, Peru
Adolph F. Reese of East St. Louis: East St. Louis and Alton area
C. L. Lauerman of Galesburg: Galesburg, Canton, Monmouth, Macomb
Frank Eynatten of Peoria: Peoria, Bloomington

President Pluth and Secretary Shaw will appreciate cooperation with district governors when an open meeting in a territory is called.

The directors voted to have new membership cards printed and sent to all paid up members of the association. All old members are cordially invited to send their check for $3.00 and receive a new membership card.

Directors are considering various state and national legislation affecting members.

President Pluth and Secretary Shaw invite correspondence, inquiries, and suggestions on any questions arising.

W. R. SHAW, Secretary,
695 E. State St., Jacksonville.

◆

Frank Eynatten, Peoria, Illinois, treasurer of the Illinois Sheet Metal Contractors Association, was taken ill on July 10th, and for several days his condition was serious, but he is now convalescing at his home.

Here's What
YOU Can Do
TO HELP CONSERVE
UNCLE SAM'S FUEL!
1 GET THE FACTS
Secure complete data on all fuel saving material and appliances. Uncle Sam is telling Americans, "See your local heating expert."
2 ADVERTISE
Tell your market about the fuel saving products you have. Field provides mats for newspaper advertising. Use them to increase sales.
3 SELL
This means telling your market how and why and at what small cost a Field Control will cut their fuel consumption. Practically every heating plant — large or small — needs a Field Draft Control.

FIELD DRAFT CONTROLS
SAVE 5% TO 25% OF FUEL

By controlling natural draft, the Field Control cuts fuel consumption 5% to 25%! The units shown cover installations ranging from space heaters to large industrial boilers — coal or oil. The domestic units require as little as 30 minutes to install. The market is enormous.

FIELD CONTROL DIVISION
H. D. Conkey & Co.
Mendota, Illinois

New Literature . . . .

For your convenience in obtaining copies of New Literature use the coupon on this page.

269—Buyers' Guide for Stampings

The Commercial Shearing & Stamping Co., Youngstown, Ohio, is distributing "The Little Hand Book," a buyers' guide for stampings and tank heads, with certain useful mathematical tables and formulae, in an attempt to clarify and to simplify the presentation of data to the end that customer's buyer will have the minimum of difficulty in properly specifying their needs.

There are 88 pages and cover with sections on Tank Heads and Tank Accessories; Standard Steel Shapes; Stampings; Mathematical Tables and Formulae.

◆

270—Punching and Notching Equipment

Wales-Strippit Corporation, North Tonawanda, N. Y., offers Bulletin G giving a brief description of their manufacturing and engineering facilities, as well as the patented features built into Wales punching and notching units.

Unique features include the self-contained punch and die holder; permanent alignment of punch and die; independent holder for quick removing or resetting on rails, templates or T-slotted plates, unlimited patterns with the same group of units, and many others.

◆

271—Rivnut Blind Headed Rivet

The B. F. Goodrich Company, Akron, Ohio, is distributing a 12-page manual containing complete description of the Rivnut in standard countersunk and flat head types. The grip ranges are given, instructions for applying the Rivnut, two pages of charts giving all essential data, a description of both power driven and hand tools for applying, tables on typical ultimate strength, strength in double shear with no reinforcements, torque resistance of Rivnut keys, thread strength, shear and tension tests, and a page devoted to Rivnut weights.

◆

272—Ways to Prolong Fan Life

Buffalo Forge Company, 497 Broadway, Buffalo, N. Y., is distributing a 20-page pocket-size booklet on the maintenance and installation of Buffalo fans.

In simple, easy-to-read form and with instructive illustrations, this Buffalo book covers comprehensively all important steps in the installation and maintenance of fans and conditioning equipment. It covers many points sometimes overlooked in the care of equipment, and should prove an effective reference guide for erection and maintenance men. It presents, from a practical angle, recommendations on such subjects as fan foundations, installation, bearings, rotors, drives, couplings, fan balancing, inspection, cleaning, repairing, painting, safety precaution.

Today, when conservation of equipment is so vital to war production, this Buffalo contribution to better fan performance is available free of charge.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.
Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

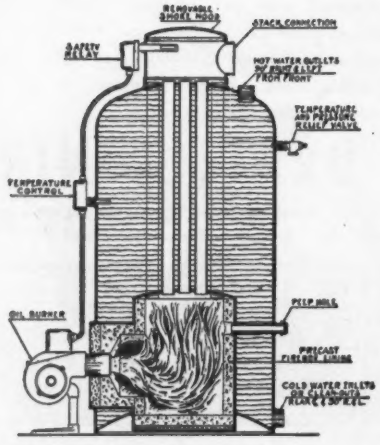
50	51	52	53	54	55
269	270	271	272		

Name .....

Company .....

Address .....

Are you Manufacturer——Jobber——Dealer——



This is the famous

AQULUX-225

. . . our most popular Heavy-Duty model. It is fully automatic. Has an 80% Efficiency Rating. Capacity—270 g.p.h. at 100° rise. Tank holds 230 gallons. Other Aqulux models have capacities up to 540 g.p.h.

WANTED by U.S. ARMY!

140,000,000 Gal. HOT WATER *every Day*

. . . for hot lather to wilt whiskers . . .
hot showers to loosen aching muscles . . .
hot dishwater for weary KP-s . . . hot towels in the quiet hands of Army Nurses. Few items are more essential to the comfort, health and morale of fighting men.

What the exact daily consumption may be, only a magician could say. It can't be far from the figure named above which is based on 20 gallons per man for a 7,000,000 man army.

This much we *do* know; Aqulux Water Heaters built in our plant are supplying a *lot* of it. Army Posts all over America are using our big, wartime Aqulux models because of their high efficiency, their fuel saving, and because they are built with a minimum of essential materials (no insulation; no jackets; no galvanizing).

There is a double satisfaction for us in this assignment . . . because it utilizes all the skill and experience we have gained in forty years of building fine oil-burners . . . and because we know it contributes to the health and happiness of the men who are fighting our fight. Unspectacular, yes! But indispensable. Even though it may win no actual battles . . . *hot water is "ammunition," too!*

If you are working on water-heating problems for the government or for an essential industry, perhaps we can help you. We'll gladly try.

S. T. Johnson Co., 940 Arlington Ave., Oakland, Calif.
and 401 No. Broad St., Philadelphia, Pa.

S. T. JOHNSON CO.

40 years of engineering and building fine Oil Burning Equipment

With the Manufacturers . . .

Worthington Acquires Ransome Machinery

Worthington Pump and Machinery Corporation of Harrison, N. J., announces the acquisition of Ransome Machinery Company of Dunellen, N. J., as a wholly-owned subsidiary of Worthington.

Ransome, designers and builders of machinery since 1850, manufacture concrete mixers and road paving equipment that will augment the present Worthington line of portable compressors and contractors' air tools, rounding out Worthington's offering to the construction equipment field.

Ransome welding positioners and turning rolls will also constitute a logical addition to the varied lines of general industrial and power equipment now manufactured by Worthington.

Personnel

Ensign Roger M. Galloway, formerly of **Automatic Humidifier Company**, and son of **Jim Galloway**, is now with the Naval Air Corps, and has recently been appointed to the Naval Academy at Annapolis, Maryland, training in aerology.

◆

Willis Mehrings, son of **Frank Mehrings** of the **Meyer Furnace Company** of Peoria and the **National Warm Air Heating & Air Conditioning Association**, has had special training at Camp Crowder (Missouri) after receiving his basic training at Atlantic City, and is now at Hammer Feld, Fresno, California.

◆

The Barber-Colman Company, Rockford, Ill., announces the appointment of the **Edwin C. Anderson Company**, 1863 Wazee Street, Denver 2, Colo., as distributor for Temperature Control and Uni-Flo products for the states of Colorado, Wyoming and the three western-most tiers of counties in the State of Nebraska.

Mr. Anderson has been long associated with the heating, ventilating and air conditioning industries.

◆

B. K. Paget has been appointed sales manager of **The Allen Corporation**, Detroit, according to an announcement by J. J. Hogan, general manager.

Mr. Paget has had a wide experience in the natural ventilation field, having been at one time sales manager of the Swartwout Company, Cleveland. He is the creator of several new inventions and devices in the industrial ventilation industry and certain of these will shortly appear on the market under the Allen name.

◆

Gustave J. Hanisch, widely known in the copper industry for many years, died suddenly Wednesday, July 28, at his summer home on Lake Geneva, Wis., and was buried Saturday, July 31, from Chicago.

Had Mr. Hanisch lived until next Christmas day, he would have been 70 years old. He was engaged in the copper business for 50 years and served some of his copper accounts into the third generation of contractors.

Mr. Hanisch retained a vivid recollection of copper work throughout the middle west and was considered an authority on old copper installations. For many years Mr. Hanisch was connected with the Chicago office of Revere Copper and Brass, Incorporated, and prior to that with the firm of Hanisch Brothers, and also with Baltimore Copper Company prior to the company's affiliation with Revere.

Mr. Hanisch is survived by his widow, one married daughter and a son, who is a student at the University of Illinois.

H & C BASEBOARD REGISTER NO. 130

*Available in ALL SIZES FROM STOCK!

If you have been worried over where and when you can get the necessary registers for forthcoming installations, here is good news for you.

• BASEBOARD REGISTERS—Both our No. 120 and No. 130 Series Baseboard Registers are available from stock in all sizes in the superb Metalustre finish.

• SIDEWALL REGISTERS—No. 330 Fin Type Register, sizes 10 x 8 and 12 x 8, and Class 345 Reversible Register, which has replaced Class 340 and Class 350 for the duration, are also available from stock. Class 345 is a plain lattice register made in sizes 8 x 10, 8 x 12, 9 x 12, and 10 x 12.

FLOOR REGISTERS—The long popular No. 200 Series is again being made and prompt shipments may be had in all of the following standard sizes: 6 x 8, 8 x 10, 8 x 12, 9 x 12, 10 x 12, 10 x 14, 12 x 14 (Black Japan and Oak Finishes). This register, with its neatly formed fretwork, large free area and fine finish is an excellent product in every respect, and, with the patriotic consent of the great majority of our customers, is being furnished instead of Class 210 to conserve material and manpower.

For details of the above registers see current Catalog No. 42

H&C

HART & COOLEY MANUFACTURING CO.

World's Largest Manufacturers of Registers, Grilles, Furnace Accessories

HOLLAND • MICHIGAN

Interpretations, Amendments

(*Continued from page* 36)

CMP Facsimile Signatures

Part 944—Regulations Applicable to the Operation of the Priorities System (Priorities Regulation 7, as amended July 6, 1943).

§ 944.27. *Priorities Regulation No.* 7: *Signature of Endorsements or Certifications.* (a) Whenever an order or regulation states that a purchase order or delivery order (or a document referring to it) must carry an endorsement or certification, the endorsement or certification must be signed by the party placing the order or by a responsible individual who is duly authorized to sign for that party. The signature must be either by hand or in the form of a rubber stamp or other facsimile reproduction of a handwritten signature.

(b) If a facsimile signature is used, the following requirements must be observed: The individual whose facsimile signature is used, or another responsible individual who has been duly authorized by him to act for him, must give his approval each time the facsimile signature is put on an endorsement or certification. This approval must be shown each time by a written record signed or initialed by the individual who approves the use of the facsimile. A single record may refer to several purchase or delivery orders as to which the use of the facsimile signature has been approved at the same time, but each order must be separately shown on the record. The record need not be sent out with the order but must be kept on file with it for at least two years for inspection by representatives of the War Production Board.

(c) The party who places the order, the individual whose signature is used, and the individual who approves the use of the signature will each be considered to be making a representation to the War Production Board that the statements contained in the endorsement or certification are true to the best of his knowledge and belief, subject to criminal penalties for misrepresentation.

(d) The provisions of this regulation supersede any inconsistent provisions in any regulation or order issued before July 6, 1943, regarding the way in which endorsements or signatures are to be signed.

Issued this 6th day of July, 1943.

WAR PRODUCTION BOARD,
By J. Joseph Whelan, Recording Secretary.

◆

Revised CMP-4B List

A REVISED Official CMP Class B Product List, including a Class A Civilian Type End Product List, has been issued by the War Production Board. This List supersedes the earlier Class B Product List published December 21, 1942.

The List is substantially the same as the December 21 List, but incorporates the following changes: (1) Air-borne Special B products have been deleted; (2) the previously carried partial list of maintenance and repair items has been eliminated; (3) a new category of Class A Civilian Type End Products has been established.

★

Wherever sheet metal is being sheared or formed, Niagara Power Squaring Shears and other machines are giving more production per hour.

In addition to speeding up production, they are also helping to keep wheels turning and planes flying by doing the many jobs essential to maintenance and repair.

The Series No. 3 Shear illustrated at right is just one of the many modern Niagara machines which are doing important work quicker and better.

• • •

Niagara Machine & Tool Works, Buffalo, N. Y. District Offices: Detroit, Cleveland, New York.

BUY UNITED STATES WAR BONDS

In some instances, with respect to specific products within each classification, definitions and interpretations have been listed. These are intended to clarify the scope of product groups to aid manufacturers in classifying their products.

Regional Offices of WPB have been provided with definitive lists in order that manufacturers who have questions as to whether or not their product is included in one of the board categories in the Class B List may refer their problem to the Regional Office.

Civilian Type End Products are those for the manufacture of which procuring Claimant Agencies hold contracts with prime consumers, as defined in CMP, and for which the Agencies may elect to allot controlled materials directly. In such a case, the Claimant Agency will notify the prime consumer to submit applications directly to it on Form CMP-4A for controlled materials required to cover the Agency's authorized production schedules. In the absence of such notification from a procuring Claimant Agency, prime consumers manufacturing the specified products must apply for controlled materials and authorized production schedules to WPB on Form CMP-4B.

Copies of the Official CMP Class B Product List and Class A Civilian Type End Product List are available in War Production Board Field Offices.

◆

M-43 (Tin Order) Revised

WPB, May 25, amended order M-43 to correct certain inequities in the conservation of the nation's supply of tin. In some cases it has been found that necessary uses had been eliminated, and in others that the tin content of material had been too greatly reduced.

The use of 38 per cent tin solder for wiping lead pipe joints in making connections with outside mains is now permitted because of the pressure at these connections.

The use of tin for tinning and retinning equipment used in the preparation of food by institutions, industrial and commercial establishments is also permitted. This is necessary because of the limited amount of new equipment available.

With the issuance of Order M-43 as amended, Order M-43-a has been formally revoked.

The revised order states—

LIST A

Pursuant to the foregoing order, the use of tin in any form, including semi-finished and finished products, in the manufacture of the items and for the purposes listed below is prohibited:

13. Zinc galvanizing.
18. Ornaments and ornamental fittings.
20. Plating or coating for decorative purposes.

SCHEDULE 1

Pursuant to the foregoing order, tin may be used only in the production of the items and for the purposes set forth in this Schedule, subject to any limitations, restrictions or conditions specified with respect to any such item or purpose, and then, only to the extent that substitution of a less critical material is impracticable:

(3) *Tin plate, terne plate and terne metal.* Tin plate, terne plate and terne metal, as respectively defined in Supplementary Order M-21-e, as from time to time amended, may be manufactured as permitted under the provisions of said Supplementary Order. Terne metal, however, may be manufactured from secondary tin only.

(6) *Solder.* In the manufacture of solder, the tin

YES!

WE CAN NOW MANUFACTURE THE REGISTERS YOU WANT!!

Because we are able to comply with certain materials and manpower specifications contained in the War Production Board's M-126 directive, we are now in a position to manufacture Registers for Defense Housing, Army, Navy, and other needs.

If you have used R & G products in the past you are familiar with the ingenuity of our designs and quality of workmanship; this new line of Registers lives up to our established standards in every respect—we offer this merchandise without apologies of any kind!

NON-METALLIC GRILLES AVAILABLE

We have developed Return Units in non-critical materials, which we urge you to consider in place of metal, whenever possible. These substitute products have been installed for many months and we have satisfactory reports from users. Also available: A full line of accessories, including Air Filters, etc.

Remember, R & G executives are always at your service. If you have special needs, we'll try to help you. If we haven't got what you want we may be able to tell you who has!

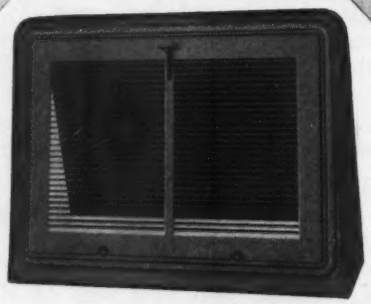
PLEASE STATE PRIORITY RATING WHEN INQUIRING

REGISTER and GRILLE MANUFACTURING CO. Inc.
74 BERRY ST. • BROOKLYN, N. Y.

TODAY and TOMORROW

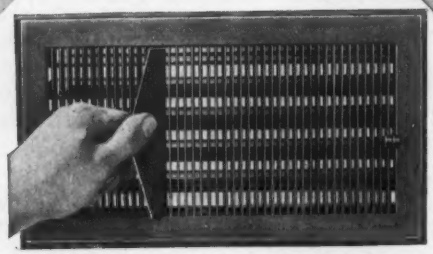
NOW for current use—TOMORROW for the after-victory building boom—whatever your register needs you can count on U. S. to lead the way in modern design and price.

No. 40 SERIES
GRAVITY BASEBOARD REGISTERS



Today's finest! Least resistance—complete non-vision of Register Interior with Removable Grille and Patented Grille Locking feature. Leakproof when properly installed.

No. 256 4-WAY FLOW
AIR CONDITIONING REGISTERS



Complete, versatile control . . . beautiful exterior! Vertical Grille Bars adjustable to desired lateral airflow with bending Wrench. Lever-operated Horizontal Rear Valves for Upward or Downward Deflection.

★

Pipe and Fittings now Available

Ask for 41F Fitting Catalog

UNITED STATES REGISTER CO.
BATTLE CREEK, MICHIGAN
MINNEAPOLIS • KANSAS CITY • ALBANY

Fresh Air Is SURE with "ALLEN'S"

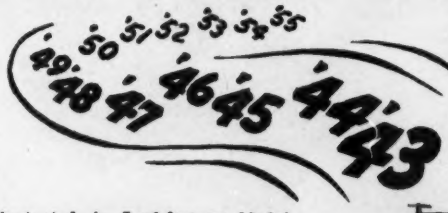
A TYPE FOR EVERY NEED

Perfect ventilation is a war-production "must." Let Allen ventilation engineers report on your needs and recommend the most suitable type of equipment. Allen provides wide choice—famous self-operating Coni-Vane Turbines; Electro-Wind Coni-Vane with auxiliary power; Stationary types of various forms. Let ALLENS clear the atmosphere for maximum production.

Send today for fully descriptive and illustrated catalog. Wire or telephone if urgent. Representatives in most principal cities.

The ALLEN Corporation
9749 Erwin Ave. • Detroit, Michigan

. . . SERVING *NOW* AND FOR YEARS TO COME!



Illustrated is Lockformer Model 22, with Power Flanger attachment.

Owners know that the same Lockformers which stand up so ruggedly under the "speed-up" stress of governmental building will be on the job for peacetime tasks. Whether you're buying your first Lockformer or your fifth, you can depend upon it to give you years of trouble-free service—and to cut labor costs drastically. *Over 4,000 in use today!*

Write for the Lockformer catalog showing many Lockformer models, Easy Edgers, Power Flangers and other sheet metal working equipment.

The LOCKFORMER Co.
4617 ARTHINGTON STREET, CHICAGO, ILLINOIS

content shall be limited as follows according to the purposes for which it is to be used:

(i) For the repair of gas meters in accordance with Supplementary Order M-43-b, as amended—not more than 38% tin by weight;

(ii) For wiping lead-sheathed cable joints or lead pipe joints—not more than 32.5% tin by weight;

(iii) For use in the manufacture of industrial instruments (as defined in Conservation Order L-134) and their associated control valves—50% tin by weight: Provided, that solder of a lower tin content shall be used whenever its use will not cause damage or change the physical or electrical properties of the part soldered;

(iv) For the installation and repair of water service pipes connecting the piping of a structure with the outside water main—not more than 38% tin by weight.

(v) For all other purposes, not more than 21% tin by weight.

The total quantity of tin which any person may use in the manufacture of solder during any calendar quarter, beginning January 1, 1943, shall be limited to 50% of the quantity used by him in the manufacture of solder during the base period.

(9) *Dairy equipment.* Tin may be used to coat fluid milk shipping containers which are manufactured within the restrictions and in accordance with the provisions of Conservation Order M-200. Tin may be used to manufacture dairy equipment other than such fluid milk shipping containers, but the total quantity used by any person in the manufacture of such other dairy equipment during any calendar quarter beginning January 1, 1943, shall be limited to the quantity used by him for such purposes during the base period. Any dairy equipment may be retinned, provided only that the amount of tin which any retinner may use during any calendar quarter, beginning January 1, 1943, for the retinning of dairy equipment, shall be limited to 150% of the quantity used by him for such purposes during the base period.

Death of Daniel Upton

William Daniel Upton, president of **Champion Furnace Pipe Company**, 918 South Adams Street, Peoria-2, Illinois, died Wednesday, July 28.

Mr. Upton organized the Champion Furnace Pipe Company in 1934. He was made president of the corporation at that time and held that position until his death. Before that, he was an officer of the Walker Hardware Company, Peoria, for thirty years. In December last, Mr. Upton was injured while running to catch a street car, but in spite of this injury kept up his duties until July 24.

Mr. Upton was a member and elder of the First Presbyterian Church, a member of the Association of Commerce, the Creve Coeur Club, Sons of the American Revolution, and the Knife and Fork Club.

The corporation he formed has had a steady growth each year and had plans for purchasing a new building. Following the funeral services for Mr. Upton, the directors held a meeting and decided to purchase the building and are now moving into their new building at 211 Eaton Street, Peoria. The new building is much larger and will permit all manufacturing on the ground floor. The board of directors decided not to make any change in the offices until the annual meeting next January.

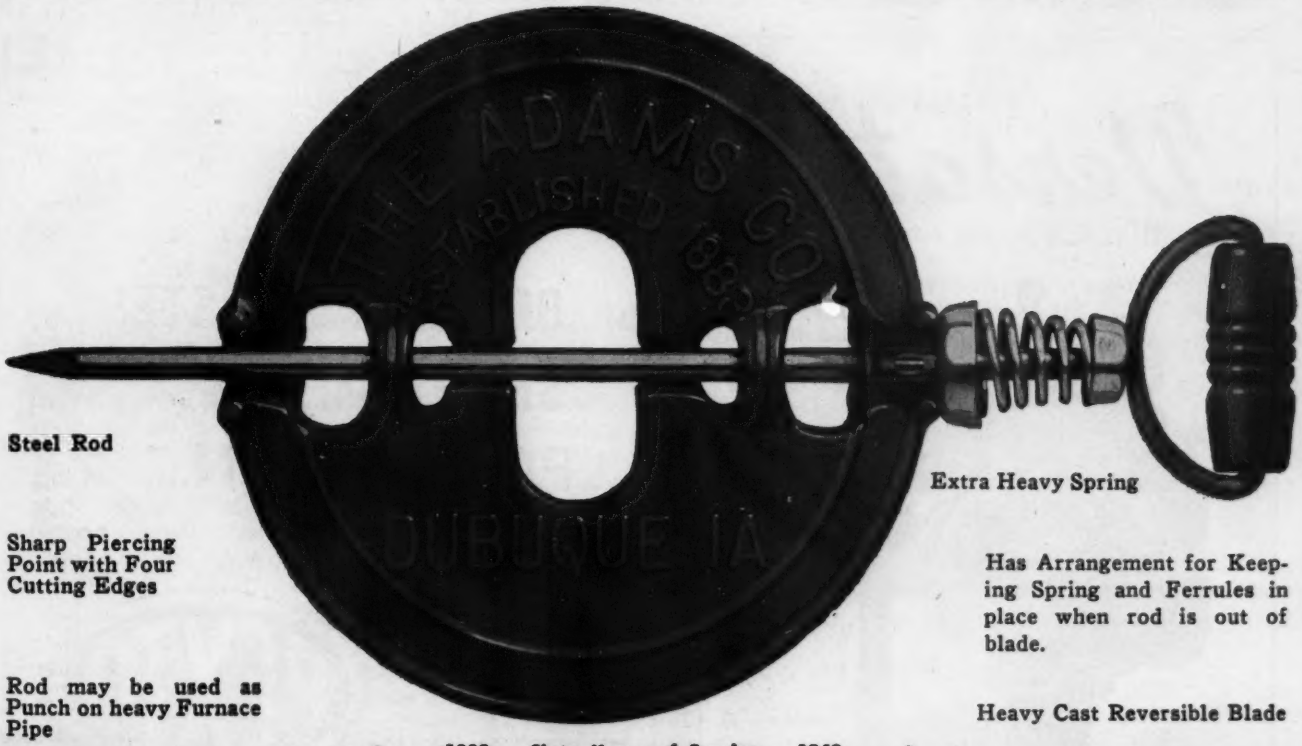
Officers and directors before Mr. Upton's death were: **William D. Upton**, president; **Edward G. Beeson**, vice-president; **Robert B. Dougherty**, secretary-treasurer.

The directors included the officers and **William A. Wiedemann** of Kansas City, Missouri.

Death of Henry Chambers

Henry Chambers, long an outstanding and greatly revered figure in the heating industry in Detroit, was buried from his home at 18460 Santa Barbara, Detroit, on Saturday, July 17.

Mr. Chambers, always a hard worker, spent the last moments of his 73 years in actual physical labor in his shop.



Steel Rod

Extra Heavy Spring

Sharp Piercing Point with Four Cutting Edges

Has Arrangement for Keeping Spring and Ferrules in place when rod is out of blade.

Rod may be used as Punch on heavy Furnace Pipe

Heavy Cast Reversible Blade

• 1883 — Sixty Years of Service — 1943 •

ADAMS DIAMOND SMOKE PIPE DAMPER
MANUFACTURED BY
THE ADAMS COMPANY
DUBUQUE, IOWA, U. S. A.

One rode on a camel's back

Illustrated: Photographic Print Washer for Field Lab., U.S. Army Air Corps.

(Payne Products Are in the Fight, from Ain-Beida to Reykjavik)

STREAMING to global war fronts—by 'plane, rail, ship, half-track, even camel-back—are strange new products of the PAYNE plant at Beverly Hills. They bear little resemblance to the furnaces we made in pre-war days, but each is built to the same high standards of precision and durability. ★ The device illustrated typifies PAYNE'S wartime production. After Victory, our Dealers will have even finer PAYNE heating equipment to supply post-war demand.

PAYNEHEAT

NEARLY 30 YEARS OF LEADERSHIP

Payne FURNACE & SUPPLY CO., INC., BEVERLY HILLS, CALIFORNIA

Versatility . . .

COMBINATION ROTARY MACHINE

For BETTER . . FASTER SHEET-METAL FABRICATION

The versatility of PEXTO machines, both manual and motor driven, permits easy adjustment, a wider range of operations and the highest quality production in minimum time.

That is why the PEXTO trademark has become so familiar where quality counts and machine investments are carefully considered.

PEXTO

THE PECK, STOW & WILCOX COMPANY Since 1835 SOUTHINGTON, CONNECTICUT, U. S. A.

N. W. A. H. & A. C. Ass'n History

(*Continued from page 67*)

most important gatherings of the Association. It was the first convention the organization had held at the University of Illinois and the attendance overtaxed the capacity of the Urbana hotels.

David Kinley, president of the University of Illinois, welcomed the convention cordially, as did Professor M. S. Ketchum, dean of the College of Engineering and director of the Engineering Experiment Station and for many years a valued friend of the National Warm Air Heating and Ventilating Association and its cooperative research at that college.

Then came the report of the Joint Committee favoring the purchase of a suitable lot in Urbana and building thereon a research residence by the Association and the enthusiastic and unanimous adoption of the report, thus assuring the erection of what is now the Association's widely known and useful Research Residence, located at number 1080 West Stoughton Street, Urbana, housing the most complete equipment known for the investigation of residential heating and other phases of air-conditioning.

A resolution was also passed creating a Board of three Trustees to hold title to the property so as to assure transfer of clear title at any later date. The original Trustees were Arthur C. Willard, Fred W. Phelps and Allen W. Williams. Later upon the retirement of Mr. Phelps from the industry, W. G. Wise was selected as his successor.

The following April, 1924, found the Association back in Cleveland for another meeting and the Research Advisory Committee reported that immediately after the December convention it had, as authorized, purchased a desirable site for the Association's proposed Research Residence, and Architects R. W. Kissenger and L. H. Purine had been employed to design the house under the direction of Professor Willard, Professor Kratz and Professor Day. Construction had commenced with completion promised during the coming fall.

Dissemination of Information

However, the organization was not confining its activities to its research work alone, but was doing much in the way of publicity that would advance the furnace system, giving thought to the formulation of improved installation codes, accurate costs, extending its contacts with its dealer customers and distributors. Further, it was constantly finding new appliances and appurtenances requiring study and consideration, among them oil burners, automatic controls, better humidifiers and improved methods for cleaning inside air.

The need was now apparent for a more systematic distribution of pertinent information which would be helpful to the membership, so the organization's mimeographed monthly letter, which was supplemented with frequent special communications to the membership, grew into a four-page printed bulletin. This bulletin was popular and was finally increased to eight pages and illustrations were added. On one occasion and for a short period the "Monthly Bulletin" was placed in professional hands and published in much larger size, but there was a preference for the simpler form and the association returned to the more modest publication.

Are You Working on Post-War Plans?

When the war is over will your organization—your product—your service—readily adapt itself to post-war conditions? Have wartime developments revealed the extent to which new designs and methods must be considered?

We at White-Rodgers cannot answer these questions for you. But, if the control of temperature and pressure is essential to the successful application of your product or service, we will be glad to tell you about the White-Rodgers Hydraulic-Action principle of temperature control and the advantages it offers.

To assist you in setting up your post-war plans we have prepared a "Post-War Planning Checklist." We will be glad to send you a copy upon request.

HYDRAULIC ACTION CONTROL

WHITE-RODGERS ELECTRIC CO

1215h CASS AVE. ST. LOUIS, MISSOURI

Women Sheet Metal Operators

(*Continued from page* 59)

early enough the night before. However, generally they soon become accustomed to earning more money and settle down.

"For the most part girls are more individualistic than men. We have only seven plant rules to restrict employees, but we have found that women are not as easily regimented as men. They are most attentive to instructions; meticulous in carrying out orders, and get along with their fellow workers, both men and women, very well.

"A peculiar thing about women starting work in a war plant is that a large percentage of them, the first day on the job, smear their hands, arms and face with grease. They get a great deal more dirt on them than they need to or than they do a week later. They seem to have a complex which compels them to show they are at home in a plant by deliberately getting dirty.

"The company provides gloves for certain workers, but a new girl will ignore these for several days. She does not want to be thought 'fussy.'

Some Like the Night Shift

"Yes, we have married women with children, as well as married and single women. They work on all three shifts. Usually the young girls prefer to work on the first shift so they can have their evenings. The woman with a child may leave it with her parents while she works on the night shift so she can be with the baby in the daytime."

There is nothing dainty about the luncheons the women factory workers bring, nor the container they bring it in, according to Dr. McIlvain. Paper bags are seen most frequently under the arms of the girls who stream into the Budd plant. They are not dainty little one-pound bags either. Bulging ten-pound bags carry man-sized sandwiches, fruit and pie. Milk and other beverages can be had at the plant.

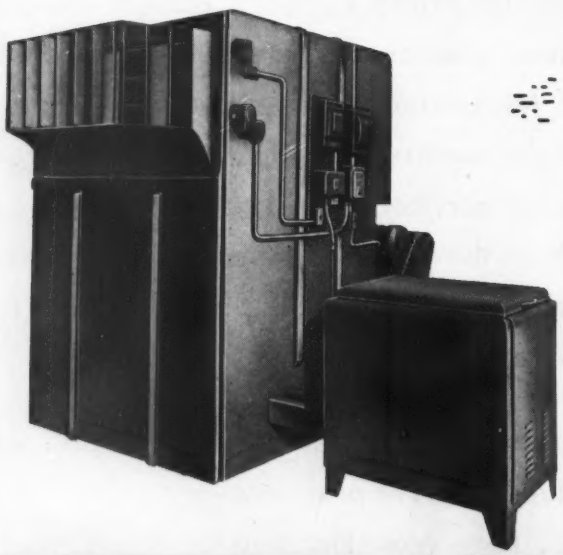
Physical and Mental Tests

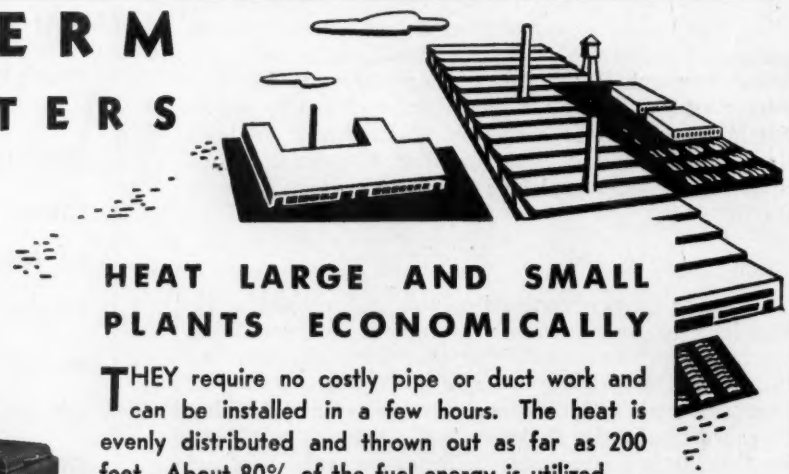
"A staff doctor and nurse give every girl applicant a physical examination," Dr. McIlvain said. "Practically everyone passes it. However, our mental evaluation of the applicant is more heavily stressed with women than with men and consequently causes more rejections. We recognize there is an emotional difference between men and women. We do not want mannish women in the plant, but at the same time we do want women who are emotionally stable. This results in a high percentage of rejections among women applicants.

"No, women are not a problem to us. We have worked with them for years and we like to have them around. Our chief difficulty right now is to get enough workers of any kind, men and women, and the percentage of women will increase as the months pass."

DIRECTHERM

UNIT HEATERS





HEAT LARGE AND SMALL PLANTS ECONOMICALLY

THEY require no costly pipe or duct work and can be installed in a few hours. The heat is evenly distributed and thrown out as far as 200 feet. About 80% of the fuel energy is utilized.

Directherm Unit Heaters do not require any maintenance. All you need is to set the automatic controls.

For coal, gas, and oil.
Made in 6 sizes (300,000—1,700,000 BTU).

AIRTHERM

MANUFACTURING COMPANY

706 S. SPRING AVE. • ST. LOUIS, MO.

Don't Turn Down Roof Ventilator Business

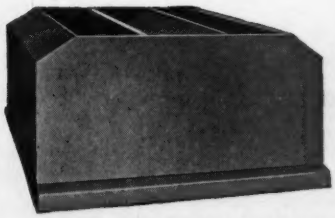
· · install

Swartwout Steel Ventilators

for critical industries requiring heat and acid resisting equipment—

or

Swartwout NCM Line



for buildings where steel equipment is not essential. Write for complete data on Swartwout Regular Line and Swartwout NCM Line.

THE SWARTWOUT CO., 18511 Euclid Ave., Cleveland, O.

Swartwout VENTILATION SPECIALISTS

★ *THE HEALTH AND EFFICIENCY OF THE NATION'S WORKERS ARE IN THE HANDS OF AMERICA'S HEATING MEN SO . . . .*

FIX ALL FURNACES NOW!

★ America's homes must be efficiently heated this winter . . . for the health and comfort of war workers and their families. It is up to *you* to check every furnace in your territory now and be sure that all necessary work is done.

★ Call on your customers now and call on Northwestern for furnace, stove and boiler repair parts.

★ ***Northwestern parts fit perfectly, require the least labor for installation. You get more jobs done in less time. Use Northwestern Parts on all jobs!***

NORTHWESTERN STOVE REPAIR CO.

Manufacturers of Stove, Furnace and Boiler Repair Parts

662 W. Roosevelt Road Chicago, Ill.

Lochinvar

OIL BURNING WATER HEATER

When peace comes remember that Lochinvar's Multiple-Stage Burner effects greatest fuel economy . . . completely automatic operation is safely controlled by Underwriters Lab. Approved Controls . . . and their perfect, trouble-free performance and right price will gain you many sales!

☆ ☆ ☆

LOCHINVAR PRODUCTS DIVISION

MICHIGAN TANK & FURN. CORP.

14101 PRAIRIE DETROIT, MICH.

ATH-A-NOR

The Aggressive Dealers Choice

ALWAYS

Yes, Ath-A-Nor Furnaces have been the choice of aggressive dealers for over 50 years, and will continue to be, after the duration when business returns to "as usual."

For the duration when furnaces MUST be replaced, use an Ath-A-Nor. You can be certain that it is the utmost in quality, economy and efficiency . . . will perform perfectly and assure you of a satisfied customer . . . and remember, collect all scrap metal and see that it reaches our government as speedily as possible.

MANUFACTURERS OF QUALITY HEATING EQUIPMENT FOR OVER 50 YEARS

MAY-FIEBEGER COMPANY

NEWARK OHIO

WHITNEY-JENSEN PRODUCTS
30 YEARS EXPERIENCE

FASTER .. .
EASIER . . .
BENDING
with Whitney-Jensen
Roller Bearing BRAKES

12-14-16 ga.
4-5-6-8-10 ft. sizes

Combination type, for box and pan as well as all kinds of straight bending. Roller bearings mean 40% faster work, and the machine is 20% easier on the operator. Heat treated jaws for fabricating stainless steel.

ANGLE IRON Combination Shear-Notcher-Bender

All three units are mounted on a sturdy welded-steel angle iron base, for maximum efficiency and speed in cutting and bending angle iron up to 2" x 2" x ¼" size. Write for new Aircraft Tools Catalog.

Over 80 Different Items for the Sheet Metal Shop

WHITNEY METAL TOOL COMPANY
91 FORBES ST. • ROCKFORD, ILL.

KEEP 'EM FIRING
with Gar Wood

★ Self-Contained Forced Warm Air Automatic Oil-Fired Heating Units. (from 50,000 to 500,000 B.T.U./Hr.)
★ Industrial Space Heaters up to 500,000 B.T.U./Hr.
★ Boiler-Burner Units up to 25 HP.

Some Distributors and Dealers are receiving Government business for Heating Equipment. If you are one of those who are called upon to submit estimates, heating plans and surveys, we suggest you enlist our cooperation and our engineering service.

Write today for "ENGINEERING STANDARDS"—this valuable 72-page book on Engineering, Installation and Operation of Heating Systems, sent free on request to Sheet Metal Contractors and Dealers, Engineers and Architects. This offer made for a limited time only. Address reply to Dept. 14

HEATING DIVISION
GAR WOOD INDUSTRIES, INC., DETROIT
Protect Freedom—Buy War Bonds

Carry-Back, Carry-Over Losses

(*Continued from page* 64)

It is very important that the warm air heating dealer or sheet metal contractor understand the carry-over and carry-back loss provisions because, alone or in combination, they offer tax-saving opportunities. If you do not take advantage of these tax economies, you may find, that over a period of years, the net result is a loss, yet, you may pay on thousands of dollars of net income in that time. Were these provisions not in the Code, more than one taxpayer would get into unpleasant financial difficulty because he could not meet his tax bill in a profit-year, a loss-year for which he could get no tax deduction having drained too heavily on his resources or a profit-year hit so hard by high taxes that the credit to surplus left little more than consolation to keep the business solvent in a year of red.

◆

Furnace Cleaning Program

(*Continued from page* 41)

front of furnace, and if desired by customer, paint with special heat resisting paint (aluminum paint will not be obtainable this year).

17. Remove all cleanings gathered by vacuum cleaner from basement (does not include ash removal—special city license is required for this).
18. Vacuum clean floor around furnace.
19. Check and oil regulator chains (if not broken).
20. Report any *necessary* repairs to customer, with approximate cost.
21. Final inspection, and report guaranteeing that all above steps have been completed.

◆

Kruckman—Bedrock Economy

(*Continued from page* 35)

program. This plan authorizes regional, area, and district officials of War Manpower Commission, in cooperation with War Labor Board and other agencies, to give preference in supplying manpower to local civilian industries and services whose operation is urgently required to maintain the functions of society.

REMEMBER — TO BUY
GENUINE
REPAIR PARTS for
ROUND OAK — Furnaces
Stoves and Ranges

ROUND OAK COMPANY
Dowagiac Michigan

A REAL *Time Saver*

The No. 4B PUNCH

by *Whitney*

This punch is accepted by leading contractors and dealers as a real time-saver in the shop and on the job. Men who use it every day know it can't be beat for clean, fast punching. Has a capacity of ¼" through 16 ga., weight 3 pounds, 8½" in length, depth of throat, 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key.

W. A. WHITNEY MFG. CO.

636 RACE ST. ROCKFORD, ILL.

THESE BOOKS ARE

FREE!

TO ALL OIL BURNER DEALERS

FOR DISTRIBUTION TO HOME OWNERS

HELP Your Customers SAVE FUEL

Imprinted with dealer name and address, these books are filled with fuel-saving suggestions that build good will for dealers and make profitable accessory and service sales. ORDER YOUR BOOKS NOW. The supply is limited. Use your letterhead.

WAYNE "V-DAY" LINE WILL BE COMPLETE

OIL-FIRED — GAS-FIRED — STOKER-FIRED
FURNACES — BOILERS — WATER HEATERS

New designs being tested and proved set new standards in heating efficiency for small homes.

LINE UP WITH WAYNE FOR POST-WAR PROFITS

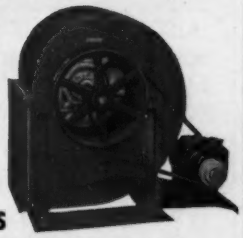
WAYNE OIL BURNER COMPANY

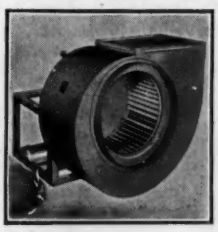
918 Glasgow Avenue **FORT WAYNE, INDIANA**

YOUR BLOWER Requirements

AVAILABLE AT

Schwitzer-Cummins Company





★ **BLOWERS FOR EVERY PURPOSE**

Double Inlet and Single Inlet

HY-DUTY Blowers, 9¾" to 25" • Top and Bottom Horizontal, and Top and Bottom Vertical Discharge • Top and Bottom Motor Mounting • Dual Units also available.

★ **CENTER DISC WHEEL**—Double Inlet, Double Width • Reinforced Center Disc • Designed for Modern Air Conditioning and Heating Applications • Sizes, 4½" to 50".

★ **ENGINEERING DATA**—Write for Catalogues showing complete Performance Data • Experienced Engineering Department available to help solve your Air Handling Problems.

BLOWER DIVISION
SCHWITZER-CUMMINS COMPANY
1145 EAST 22ND STREET INDIANAPOLIS, U. S. A.

★
★
★

Randall **BEARINGS ARE . . .**

1 Doing a flawless job on war production machinery of all kinds.

2 Standing up under all sorts of abuse—*and keeping shafts turning for victory.*

3 Available in any quantity on proper priorities.

Write for catalogs 42 and GB43 and tell us about any bearing problems you may be having.

RANDALL GRAPHITE PRODUCTS CORP.

Dept. 811 **609 W. Lake St.** **Chicago 6, Ill.**

HEAT CONTROL
in a package for
Homes of the Future

These ingenious, gas-actuated, automatic control package sets are unbelievably low in cost, but they add a tremendous purchaser appeal to any residence. Handling manufactured, mixed, natural or butane gas, they are suitable for central furnaces, floor furnaces, boilers, radiators, gas ranges, water heaters, etc. B-60 Package Sets include an improved B-60 valve, with tamper-proof cover and integral pilot valve assembly, an ivory and chrome finished Trimtherm thermostat, 30 feet of wire, and a thermocouple pilot generator which provides all current needed for valve operation. Regular thermostats, thermometer thermostats and timer-thermostats available with or without night cut-off. B-60 control systems are safe, quiet, dependable and proved. Check on their many advantages now. Ask for Catalog No. 52.

GENERAL CONTROLS
801 ALLEN AVENUE • GLENDALE 1, CALIFORNIA
Branches: Boston • New York • Philadelphia • Cleveland • Detroit
Chicago • Dallas • Denver • San Francisco

...until Victory is Won...

Today men, metal and machines, at Gerett, are concentrating on fighting equipment, too.... With all the precision skill, experience and craftsmanship developed through years of service to the Heating Industry. Meanwhile, E-Z-ON DAMPER REGULATORS, both Standard and "Snap-Tite" types, are in stock in our factory and at the best Jobbers everywhere. Use them to save installation time and labor on important war housing projects.

★

M. A. GERETT CORPORATION
722-724 West Winnebago St. • Milwaukee 5, Wis.

But in order to call upon WMC to provide manpower, the local business must subscribe to certain wage scales and agree to certain work-hour schedules and to other regulations. In a sense, those who accept the "locally needed" WMC program submit to a degree of socialization. There is sound reason for some control of this kind because it is proven that a substantial number of industries hoard skilled workers, even though they do not actually need them for the moment. Under the circumstances idle workers are just as fantastic as idle stockpiles. It has been seriously suggested that some of the manpower problem might be eased by giving war contracts in the immediate future to areas where there is idle labor. There is a general anticipation here that late this year, or by New Year, shift in major war work may release sizable pools of workers.

Manpower Conservation

There is indubitably a tendency to kill all but absolutely necessary services and industries in order to create more manpower for industries and services that must be kept in operation. A sort of master list of 3,000 items has been assembled as a guide to determine the irreducible minimum of things the civilians must have to keep the social organism going. This does not by any means indicate that 3,000 items will finally be listed as necessary.

A. D. Whiteside, head of the re-formed Office of Civilian Requirements, has sent out a great corps of interviewers who are canvassing the housewives and the individual consumer in his home and place of business in 18 or 20 metropolitan areas to find out what people think they need most urgently. The canvass has focussed recently on the areas centering in Chicago, Detroit, Milwaukee, St. Louis, Kansas City, New York, Philadelphia, Boston, Pittsburgh, Knoxville, Raleigh, Atlanta, Dallas, Denver, Salt Lake City, Los Angeles, San Francisco, Seattle, New Orleans, Buffalo, Indianapolis, Memphis. The canvass started this month and is expected to be completed by the end of October. The study will include fuel, gasoline, clothing, food as well as durable goods. It should reveal lack of services and in living facilities as well as in other things.

Minimum Living Standards

Whiteside also has asked the members of Congress to obtain similar information from their constituents to determine what is needed in various areas "to maintain minimum living standards." It should be marked that *minimum needs* will be the yardstick WPB will use to test the indispensability of an item. It is only reasonable to assume that the Army will contribute the services of some of its officers, who have been trained in the Army Industrial College, to sit in on this study. It is predicted, already, that supplies to be found in the retail stores of the nation will be down approximately 60 per cent on New Year's Day as compared with the inventories of the stores on January 1, 1945.

The general idea here is that the emphasis next year will be far more on repair parts and replacement allocations rather than on new things. The suggestion here is that you people in business in all parts of the country may probably be able to get a preview of the things whose production will be permitted by keeping in touch with the Smaller War Plants Corporation. There is every reason to assume they will have advance information. It is hoped adjustments

.... Janette Blower Wheels

Janette steel wheels have been on the market for 18 years and manufacturers of oil burners, coal stokers, blowers, generators, superchargers, dust collectors, hair dryers, gasoline engines, heating and ventilating equipment have used them with excellent results, which are possible because of their ***patented construction.*** The steel blades are cut in pairs, pressed thru slots in the heavy back plate, then welded. The tips of the blades are pressed thru slots in the inlet disc, then bent over against the inherent spring of the blades. This prevents loose blades and results in an exceptionally rigid wheel. ***May we send information?***

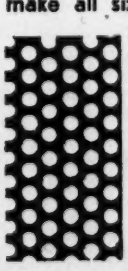
Janette

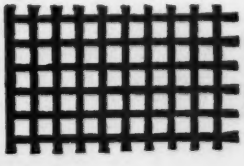
Janette Manufacturing Co. · 556-558 W. Monroe St. · Chicago, Ill.

PERFORATED METALS

ARE ESSENTIAL In Times of War and Peace

They are used in the manufacture of explosives and ammunition, flame arresters, airplanes, battleships and in many important and essential industries such as the processing of grain, food products, chemicals, metals, coal, petroleum, etc. We make all sizes and shapes of holes to meet the most exacting conditions.





The Harrington & King Perforating Co.

5649 Fillmore St., Chicago 44, Ill. and 114 Liberty St., New York 8, N. Y.

"We Do a Nice Volume Now—Thanks to CLARAGE EQUIPMENT"

War plants, army barracks and other vital war-time buildings need heating and ventilating, or exhaust and blow pipe installations. This high priority business can be your salvation. Specify Clarage Fans, Blowers, Unit Heaters! Nationally known and Nationally accepted, these highest quality air-handling products help you land the desirable jobs. **Write today for descriptive literature.**

UNIT HEATERS

EXHAUST FANS

VENTILATING FANS

COMPLETE AIR CONDITIONING
• COOLING
• VENTILATION
• FACTORY HEATING
• MECHANICAL DRAFT
• FANS and BLOWERS for INDUSTRIAL NEEDS

Clarage Fan Company Kalamazoo, Mich.

APPLICATION ENGINEERING OFFICES IN ALL PRINCIPAL CITIES

HEATING MANFR'S CONTRACTORS

Recommend and Install VITROLINER the modern complete CHIMNEY, with the HEATING UNIT,- at the same time -

Where Vitroliner Chimneys are specified with the heating unit on new construction jobs, top performance of the heating unit is assured.

By our reliable tests, the draft of Vitroliner is double that of a masonry chimney. This superior draft is especially important in one story or bungalow construction where ordinary draft is not enough to give maximum performance of the heating unit.

Throughout America over 17,000 Vitroliner Chimneys are in operation in Defense houses, giving Safe, dependable and trouble-free service. Built of finest materials obtainable.

14 years of practical experience in the field

Write for circular

CONDENSATION ENGINEERING CORPORATION

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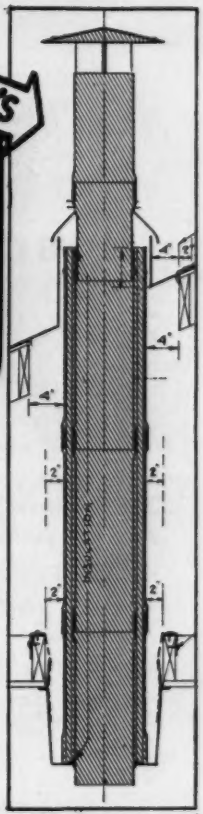


Cross Section of Vitroliner Chimney Installation in Ceiling

Only Syncromatic

Gives You Such Complete UNIT STANDARDIZATION

• Shown below are four of the six Syncromatic coal fired steel furnaces . . . in each the fronts, shakers, grates and casings, (except for sides) are identical and interchangeable.

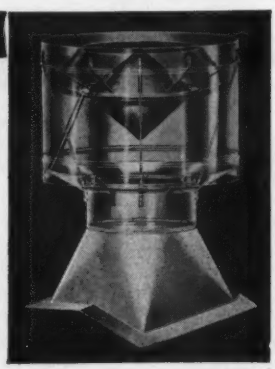
The various sizes of Syncromatic differ only in length which means economy in dealers' stocks, economy for your customers and more sales and larger profits for you. Send for Syncromatic information now!

Here are Syncromatic's big popularity points:

1. Genuine counter flow heat exchanger—a most efficient method of heat transfer.
2. Air travel to all parts of heated surfaces. No hot spots, no spot burn-outs.
3. Heavy 10-gauge completely electrically welded units.
4. Isolated genuine fire brick fire pot heats carbons in fuel for highest burning efficiency.
5. Vertical cleaning flues for best all winter performance.
6. Complete accessible soot and flyash clean out.
7. Long reverse fuel travel for perfect automatic firing of all solid fuel.
8. Low replacement costs in standard fire brick fire pots.

Syncromatic CORPORATION
3373 N. Holton Street
Milwaukee (12), Wis.

You'll Find What You Need in



BURT Ventilators

The complete Burt line supplies a type and a size for every roof ventilator job. Scientific design and quality materials make Burt roof ventilators the most satisfactory in every particular. You can give your customer "More Air per Dollar" in any type he may specify. Burt Engineers are always glad to help with plans and estimates. Send for catalogs.

THE BURT MFG. CO.
ROOF VENTILATORS • OIL FILTERS
EXHAUST HEADS
301 Main St., Akron, Ohio

SEND FOR CATALOGS
•
Burt Engineers are glad to help on plans

rather than new supplies will enable those responsible to ease the situation on almost all lines. Rationing is to be avoided by introducing controlled distribution in a large way.

OCR's Present Status

Civilian needs had no champion in Government until Whiteside took over OCR. Under Weiner, OCR was chiefly an instrument for socialization by lowering individual levels of living standards and lifting those of the lower brackets. Whiteside tackled the job from the standpoint of normal American principles and attacked the problem by practical methods. It was the word here that he had accepted the responsibility with the understanding he virtually had the same freedom of action that was given Gen. Johnson when he went into the Smaller War Plants Corporation. SWPC was definitely made an independent and autonomous agency separate and apart from WPB while still legally a part of WPB. Whiteside was not formally given the same blank check, but it apparently was his belief he had the same practical independence.

On this basis OCR struck out on a course of realistic action in behalf of the civilian economy that convinced us it meant business and its purposes were genuine. A new and fresh wind blew out of OCR and it was apparent its various officials laid into their specific jobs with enthusiasm. They seemed free of the inhibitions and the drags that made so many other efforts futile. The avowed purpose plainly was to act as the friend at the court of WPB and Army and Lend-Lease and the rest of the non-civil agencies, as the representative of the bewildered and unfriendly civilian.

Recently, however, it has appeared that there are difficulties. We are told Whiteside and his devoted followers have become aware they by no means have the untrammeled freedom of SWPC. They now realize they are definitely only a part of WPB, and that they are subject to all the restrictions and limitations and controls to which WPB is subject. It is apparently clear that OCR is not primarily an instrument for the civilian, but is inherently one of the instruments for War Production. It is even curbed in its relations with the public. In the beginning Mr. Whiteside and his staff maintained free and healthy direct relations with the press. They told their stories frankly and fully and enlisted the aid of those who deal with public relations. Recently they received specific and sharp directions their communications to the public must be channeled through the OWI. Some communications actually given to reporters had to be withdrawn. The lid was put on tightly and forcibly.

The Civilian's Standing

This total control of the OCR apparently is not consistent with the hopes of those who had expected much from the Whiteside new deal. The Whiteside program and its practical operation had so profoundly impressed those who were behind the enactment of the Office of Civilian Administration Act that it seemed probable the legislation would be allowed to die in Congress, even though it had passed the Senate. At this writing the champions of this law have vigorously revived their drive, and apparently have stirred the lawmakers back home to place its enactment on the agenda for early enactment when they return in September. The Act, as passed by the Senate, is now in a House Committee. There seems little doubt it will be reported out of Committee, under present cir-

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QUALITY Asbestos Products for all types of insulation: Papers, Millboards, Pipe Joint Tape, Pipe Coverings for all kinds of steam, hot and cold water lines, Asbestos Cements, Asbestos Ductboard.

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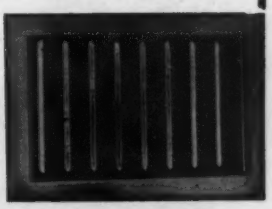

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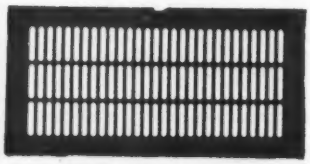

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Type E Blower shown with multiple inlet housing for flexible hose, etc.

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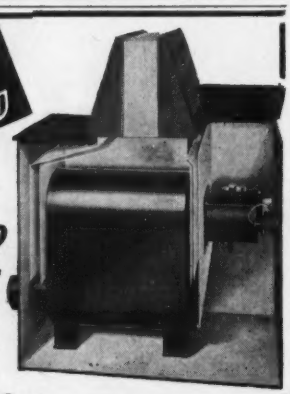
Remember **COLE HOT BLAST**

LINE OF OIL & GAS-FIRED FLOOR FURNACES

Will again be on the market as soon as its over—meanwhile we're in war work.



Our popular oil-fired Floor Furnace

COLE HOT BLAST MFG. CO.
3108 W. 51st St. Chicago, Ill.

cumstances, and will be enacted by the House and sent to the President. There is no reason to feel he will not approve it.

This law will create a new and entirely independent and powerful Government agency for the benefit of the civil economy. Apparently the agency will be a permanent branch of Government. It is generally assumed here that it will be even more important and powerful in the affairs of post-war years than it will be during the war. The implication of the creation of an agency devoted entirely to the affairs of the *civilian economy* is rather startling. It is novel in our thought and in our history. There has never before been such specific definition of the *civilian's* place in the national economy and sociology. It is difficult to determine clearly exactly what it means. It has somewhat the symptom of a condition that may grow out of the war which we do not yet understand.

There are observers here who feel that next year's elections will have some bearing on our economics. Or, rather, they tell you that they feel the upturn generally expected after the first of the year inevitably is bound to have an optimistic effect upon the domestic aspects of the election. It is natural that all phases of the experiences we are passing through should have a political implication to those who make close studies of partisan politics. It seems doubtful, however, that any substantial element should believe that there is deliberate timing in a domestic political sense in relation to any war activity. The suggestion is one of the unhappy phases of the political strategy which has developed so strongly the past decade. We call it the smear technique. It is safe to suggest this is one technique that should be abandoned at home for home consumption about home people for the duration.

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MILLIONS of Home Owners are waiting to have their Gravity and Air Conditioning Registers STREEKNOTIZED—Cost only $2.00 per register to the home owner, easy to sell, easy to install and is permanent.

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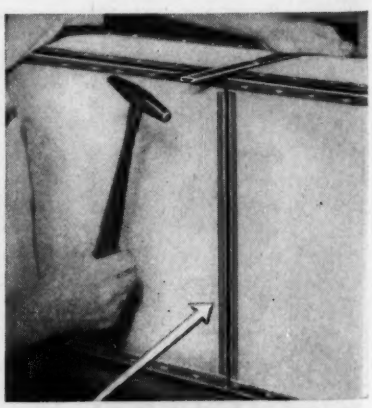

Drive cleat locks the Sheetlock "U" strips. Arrow points to "U" strips.

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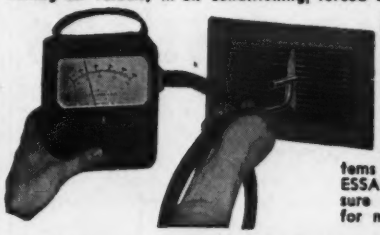

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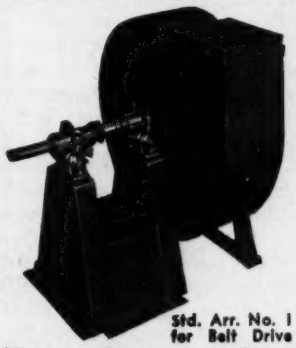

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"EX" Fans are furnished in all standard arrangements of the N.A.F.M. The design is such that it can be easily modified to suit special assemblies, thus "EX" Fans are ideal for resale purposes, as part of factory assembled units.

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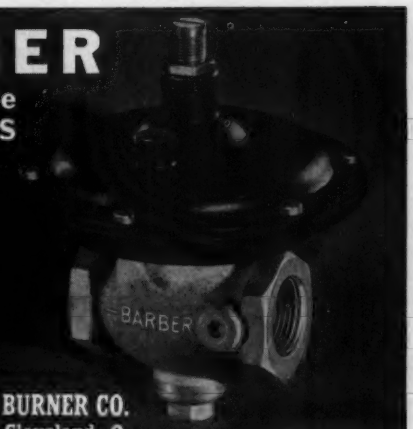

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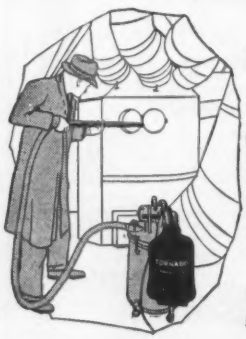
Are Still in Demand but Are Not Available



UNTIL AFTER THE WAR

The manufacture of TORNADO Furnace and Boiler Cleaners was, as you doubtless know, discontinued some time ago to make way for "essentials," on which our efforts are now concentrated.

After the war, these Cleaners will resume their rightful place not only for cleaning purposes, but for keeping you in touch with the fuel and stoker needs of your customers.

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Throatless shears that cut any shape . . . straight, circular or irregular. FASTER — Precision — accuracy! Order No. 1 for 14 gauge. No. 2 for 10 gauge. No. 3 for 3/16 inch mild steel and 10 gauge stainless.

BEVERLY SHEARS CO.
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☆ WAR TIME

Employees and officials of **Penn Electric Switch Co.**, Goshen, Ind., were again honored by the Army-Navy Production Board by the renewal of their Army-Navy "E" Award. This second award is in the form of a white service star affixed to the "E" flag and signifies continued excellence in production.

A large part of Penn's production output is the manufacture of complete electrical control circuits for naval guns. These units include the necessary switches, solenoids, transformers, lights, firing triggers, etc., necessary to the operation and firing of the 3 and 5-inch guns used by naval vessels as well as cargo ships. Penn also manufactures special solenoids for firing aircraft guns mounted on Navy fighter planes. The company builds periscopes used in Army tanks to enable tank personnel to see out of the tank.

In addition, approximately 85 per cent of the company's peacetime automatic controls have also gone to war. These include controls for heating, refrigeration, pump and air compressor applications as well as safety controls.

Joseph T. Ryerson & Son, Inc., 16th and Rockwell Sts., Chicago, Ill., believes that Ryerson steel is in action on every fighting front. It takes a long time to order steel from a mill and have it rolled and delivered, but the government and war industries can get steel from Ryerson the same day it is ordered and Ryerson steel is frequently rushed to overcome bottlenecks in the production of planes, tanks, ships and guns. The company has also built substantial sections of landing barges, corvettes, structural framework of war factories, etc.

The Ryerson War Bulletin—16 pages—has devoted six and a half pages to "News from Ryerson Men and Women" in the service with pictures and an occasional letter reproduced. The inside back cover is a "Roll of Honor" containing 434 names.

The Rudy Furnace Co., Dowagiac, Mich., reports 45 former employees in government services—services so varied that **Sales Manager Harrison** does not attempt to list them.

The company has been building ammunition box metal liners, shell base plugs, gas tanks for amphibian tanks, and multiple parts for firing anti-aircraft guns. Ninety per cent of present business consists of war orders.

All employees are co-operating fully in the purchase of war bonds.

Many former employees are at battle stations throughout the entire war area.

A large section of the plant, devoted to war effort, was recently destroyed by fire but will be rebuilt and actively operating again in sixty days.

Penn Boiler & Burner Mfg. Corp., Lancaster, Pa., **E. E. Stauffer, President**, reports six and a half million in contracts for portable generator sets for telephones, radio and radar. The company business consists of 100 per cent war orders.

Famous Patented *Monogram* Vaporizing Bu
Provides Highest Known Operating Efficiency with

Full Forced Winter Air Conditioners

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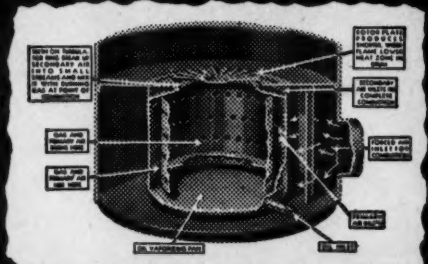
Booster Gravity Units



Utilit Roon Units

◆

Automc Wate Heate

The QUINCY STOVE MFG. COMPANY, Quincy, Illin

TRADE NEWS ☆

United States Air Conditioning Corporation, Minneapolis, announces that approximately fifteen former employees are now in service, among them

Deb Mead, Geo. E. Mead Company, Sales Representative, Seattle, Wash.—Army.

Francis Raidt, Home Office—Air Corps.

Roy Kucera, Home Office, Bookkeeping Department—Army Air Corps.

Clem Cecka, Factory Engineer—Army.

The company produces centrifugal fans on blowers for Army, Navy, Maritime Commission, and for private industry, including airplane factories, modification centers, army camps, etc. Total contracts in 1943 approximately $2,500,000.

Employees' ten per cent payroll deduction plan has been in effect since Jan. 1, 1942.—**B. P. Edelman, Gen. Sales Mgr.**

Major M. E. Clark of the Army Ordnance Department has been cited for the Legion of Merit "for exceptionally meritorious and distinguished service," announced **R. H. Whiteley, President of Randall Graphite Products Corporation** of Chicago. In addition Major Clark has been personally commended by General Campbell, Chief of Ordnance.

Major Clark, who was sales manager of Randall at the time he was commissioned in the Ordnance Department, is on a leave of absence from that company. He served in World War I in the infantry and was in France for fourteen months. He is a member of the Society of Automotive Engineers and Society of American Military Engineers.

Employees of **Skilsaw, Inc.,** manufacturers of portable electric tools, were recently honored with the Army-Navy award for excellence of production. Accepted on behalf of the employees by **Bolton Sullivan,** President, the presentation was made by General Charles Keller, U. S. A. Individual "E" pins were also presented to employee representatives by Lieutenant Commander George B. Storer, U. S. N. R., as part of the ceremony held at Skilsaw's Chicago plant.

Janette Mfg. Co., 556 W. Monroe, Chicago, reports the following from their organization in service:

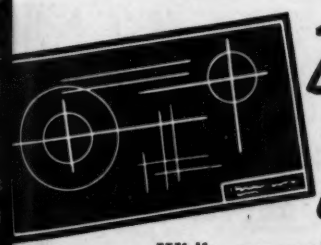
C. E. Case, Salesman, WPB, Washington.

J. J. Janette, Vice President, Captain, Air Corps, Robins Field, Warner Robins, Georgia.

The company is producing large numbers of motor generator sets—1 to 5 KW., DC/AC—for Marine service and rotary converters for about 24 Marine applications.

About 85 former employees have gone into service. Letters are received from all parts of the world.

M. L. Robinson reports that the company has developed many new electrical machines for Navy use. Many of these are sold to manufacturers and many go direct to some Naval Bureau or shipyard. Many new uses for blower wheels have been found in war work by manufacturers, which has greatly increased their wheel business.



Blueprint for Peace

While our machinery spins to turn out the goods of war, our drafting rooms and experimental laboratories hum with activity on post-war heating and air-conditioning products. We'll be ready for the post-war period; you can depend on this.

CONCO Automatic PACKAGED HEAT

CONCO CORPORATION
Division of H. D. Conkey & Co., Mendota, Ill.

V THE BIG JOB

Mercoid Controls are still being built and sold, though the volume is almost entirely on industrial types. These carry the highest war priority and find their way into war plants everywhere throughout the country, where they are doing their important part in the big job of essential production.

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FOR STOKERS
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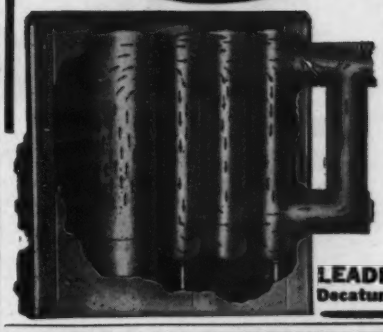

Patented Damper Uses All the Heat in the Added Heating Surface

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LEADER IRON WORKS, Inc.
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Automatic
FURNACES and WATER HEATERS

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NEW BADGER DAMPER REGULATOR Control

Installs without bolts, rivets, or hole-drilling

Here's a new idea in Damper Control installation that saves time and money on every job. No bolts, rivets or holes to bother with. Just center the BADGER Control in position on the damper, then with a few quick hammer blows on an ordinary prick punch—and you have a secure, solid fitting. Give the job to apprentice labor, and you save time, labor and money.

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- ✓ Satisfied, loyal customers
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HEIL ANSWERS UNCLE SAM'S CALL . . . and helps the Arsenal of Democracy supply materials for Victory!

THE HEIL CO.

GENERAL OFFICES: MILWAUKEE, WISCONSIN

Troubleshooting

O. B. Electrical Apparatus

(*Continued from page* 45)

by putting a ½ mfd. 600 volt condenser across the 110 volt circuit feeding the oil burner.

Motors

Motors cause the least trouble of all parts on the burner. The function of the motor is to supply power to the fan and pump. Some sort of overload protection should be connected in the hot line of the motor circuit so that in the event the pump freezes or motor becomes overloaded from other causes like lack of oil, the motor will not burn out. A simple method of providing overload protection where it is not built in the motor is to use a common pig-tail socket with a fusetron no more than one ampere above rated ampere capacity of motor. This also applies to blower motors. In case of emergency, minor repairs can be made on the job, such as new brushes, cleaning points or sticking switches; however, it is best to secure the services of a competent motor man for rewinding, bearings or other major repairs.

Fans

The fan is the mechanical draft and is that portion of the burner that mixes air with the atomized oil. It is most important that this be kept clean at all times. Lint and dirt clog it very easily and lessen the air supply to the burner, making the flame smokey and inefficient. Hanging the laundry in the oil burner room is a sure way to fill the fan and blast tube with lint. Air is adjusted by opening or closing the air adjusting damper in burner housing. The correct amount is determined by a combustion test made on the burner. The natural draft, controlled by a draft regulator (which should be on all jobs, located in the stack) should be accurate to prevent heat lost up the chimney. Use draft gauge to adjust regulator.

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for any and all makes of

STOVES—FURNACES—BOILERS

Same Day Shipments

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Fittings, Registers, Supplies

DES MOINES STOVE REPAIR CO.

112 S.W. 2nd DES MOINES, IOWA

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Drill Concrete with the "Do-All" Combination Electric Hammer and Drill. Set expansion bolts 10 to 20 times faster than with hand tools. Drills concrete, brick, stone, metal, wood. Easy to maintain. Weighs 15 lbs. Drills to 1⅝" in concrete. 2400 blows per min. Bulletin 400. Phone Austin 9866.

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CRACK DOWN ON Spatter COSTS

USE SPATTER-NOX

Reduces weld spatter 50-75%; cuts cleaning time 50%; increases welding speed 30-50%. Inhibits rust and is a good foundation for paint. Simply brush or spray on. Covers 650-700 square feet per gallon.

AND SPATTER-OFF

A companion water-soluble product. Used where welds are to be pickled for galvanizing, sherardizing or plating. Spatter-Off is non-fuming. Covers 500 square feet per gallon.

Write for Latest Descriptive Bulletin

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Will Cut Soldering Costs in Half
No More Changing of Irons

Always the Right Amount of Heat for the lightest as well as the heaviest jobs.

Quick set dividers—fastest and most accurate on the market—two sizes for circles up to 36" and 48". Guaranteed—Order now.

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Better for Every Spraying Purpose

MARLEY SPRAY NOZZLES

"Tops" for Air Washing, Humidifying, Brine Spray Lofts, etc. Marley nozzles lead all in sales and in profits to you.

*Finer, more uniform spray.
*Effective operation at Low Pressures. * No internal parts to clog or wear.

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THOROUGHLY REBUILT, for perfect performance. All types; all standard makes. All sizes including the big ones Hundreds in stock, meeting all requirements. Attractive prices. Fully guaranteed. Expert engineering counsel. GENERAL BLOWER CO., Engineers, 403 North Peoria Street, Chicago, Illinois.

NEW *Improved* PENTCO

Compound Action AVIATION — SHEET METAL and ELECTRICIAN SNIPS

QUALITY PRECISION TOOLS

No. 95A Right
Aviation
No. 96A Left

Maximum power, minimum effort.

Combination, Right and Left, No. 185-190-195.

Blades made from alloy steel. Hardened and tempered for rough use. Will cut with ease all grades of steel. Side locking feature that will not interfere with cutting blades.

Case hardened bolts.

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Write for Circular

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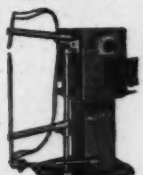

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CHAS. EISLER
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Trademark
YAGER'S Soldering Salts — Paste
Reg.

Two standard fluxes for all soft soldering. Safe, quick, certain. Buy them at your jobbers or write us if he cannot supply you.

½ lb., 1 lb., 5 lb. cans; 2 oz., 6 oz., 12 oz.

ALEX. R. BENSON CO., INC., HUDSON, N. Y.

QUICK DELIVERY!

BRAKES
POWER: 8'10 ga.; 8'12, 8'14 ga.; 6'12 ga.
HAND: 8'18, 6'18, 6'16 ga., 4'16 ga.
BOX & PAN: 7'14; 5'14 ga.

FOLDERS
36", 30", 20" PEXTO & NIAGARA.

FLOOR LATHES
16"x8' AMERICAN GEARED HEAD.
24"x15' NEW HAVEN, 18"x8' MONARCH.

MILLS
PLAIN: No. 3 RYERSON-CONRADSON; No. 2 CINCINNATI.
VERTICALS: No. 2½B K&T & No. 2 B&S.
UNIVERSALS: No. 2 B&S; No. 1 KEMPSMITH, No. 1 HENDEY NORTON.

MISCELLANEOUS ITEMS
No. 22 LOCKFORMER, 22-gauge.
2—GALLAND HENNING SCRAP BALERS.
QUICKWORK POWER BEADER.

PRESS BRAKES
OHL: 10'14, 4'16, 5'16, 66"14 ga.

OBI PRESSES
No. 4 R&K; No. 4XX WALSH.

DOUBLE CRANK PRESSES
No. 4-80 W&W 10" stroke; 4" shaft.
No. 91C TOLEDO, 4" shaft, 6" stroke.

ROLLS
ANGLE: 6x6x⅝" WICKES.
LEVELLERS: 80" McKAY, 5' NILES.

SHEARS
POWER: 6'1" HILLES JONES 27" gap., 10' 3/16" & 10'14 ga. OHL.
10'10 ga. NIAGARA; 30" NIA. FOOT.
ROTARY: 14 ga. QUICKWORK & YODER.
No. 2-A QUICKWORK, 10 ga. cap.

SPOT WELDERS
250 KVA FEDERAL PRESS TYPE.
20 & 30 KVA GIBB PRESS TYPE.
7½ KVA IDEAL; 10 KW FEDERAL.
BUTT: 55 KVA SWIFT; 35 KVA GUN.

INTERSTATE MACHINERY CO., INC. YARDS 5800
1433 W. PERSHING RD., CHICAGO 9, ILL.

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With 100% Non-Critical -- Profit Building

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Clogged and dirty filters cause fuel wastage. This is a serious problem especially in view of the shortages and stringent rationing anticipated for this heating season. Research Air Filter's easy air flow and exclusive Rip-Cleaning feature offers you greater customer satisfaction and quick service call profits.

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Featuring the Exclusive RiP-CLEANING *Process!*

FREE ADVERTISING AND MERCHANDISING HELPS include newspaper mats, direct mail pieces, radio spots, posters, window and counter display material, envelope stuffers, merchandising plans, record cards, furnace labels, and blotters. Write for sample "Sales Kit" today

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